DOCUMENT RESUME

ED 109 468 CE 004 324

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TITLE Continuing Education in Medicine: A Review of North American Literature 1960-1970. W. K. Kellogg Project Report No. 3.
INSTITUTION British Columbia Univ., Vancouver. Adult Education Research Centre.; British Columbia Univ., Vancouver. Div. of Continuing Education in the Health Sciences.
SPONS AGENCY Kellogg Foundation, Battle Creek, Mich.; Woodward (P.A.) Foundation, Vancouver (British Columbia).
PUB DATE 72
NOTE 182p.

EDRS PRICE MF-$0.76 HC-$9.51 PLUS POSTAGE
DESCRIPTORS Bibliographies; Educational Programs; Evaluation Methods; Health Personnel; *Literature Reviews; *Medical Education; *Medicine; Participant Characteristics; *Physicians; *Professional Continuing Education; Program Administration; Program Descriptions; Program Development; Teaching Methods

ABSTRACT

The literature review of continuing education in medicine surveys 282 journal articles, books, conference reports and proceedings, and other publications published between 1960 and 1970. The review is divided into the following sections: prologue, which surveys the health professions, and new directions and limitations within them; the profession and continuing education, which examines physician composition and distribution and concern for continuing education; participation in continuing education, which discusses characteristics of participants and their opinions and preferences; program organization and administration, which examines sponsors of programs, program administration, some sample programs, and recurring issues and trends; summary, which synthesizes the literature on physicians; epilogue, which summarizes participation, programs and research for the four health professions of nursing, medicine, pharmacy, and dentistry; and references. Two additional sections are included: instructional processes, which discusses small group and large group patterns of instruction, mass media, supporting devices, and organization for instructional technology; and evaluation, which covers subjective and objective assessment, and problems of evaluation. (JR)

ED109468

CONTINUING EDUCATION IN MEDICINE

A Review of North American Literature 1960-1970

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W. K. KELLOGG PROJECT REPORT #3

CE 004 324

Vancouver
Adult Education and Research Centre
and
Division of Continuing Education in the Health Sciences
University of British Columbia
1972

2/3

W. K. KELLOGG FOUNDATION PROJECT REPORTS

No. 1 A Survey of the Need for Programs to Prepare Members of The Health Professions as Specialists in Continuing Education.

No. 2 Proceedings of a Conference on Inter Professional Continuing Education in the Health Sciences.

No. 3 Continuing Education in Medicine: A Review of North American Literature 1960 - 1970.

No. 4 Continuing Education in Nursing: A Review of North American Literature 1960 - 1970.

No. 5 Continuing Education in Dentistry: A Review of North American Literature 1960 - 1970.

No. 6 Continuing Education in Pharmacy: A Review of North American Literature 1960 - 1970.

ACKNOWLEDGEMENTS

This review of the literature on continuing education from 1960 - 1970 was initiated by Dr. H. Ormond Murphy, Head, Department of Continuing Medical Education, Faculty of Medicine, University of British Columbia. The initial financial support was provided by the Mr. and Mrs. P. A. Woodward Foundation of Vancouver. Publication of the review has been made possible by the W. K. Kellogg Foundation as one of a series of reports issued by the Kellogg Project to Prepare Members of the Health Profession as Specialists in Continuing Education operated jointly by the Adult Education Research Centre of the Faculty of Education and the Division of Continuing Education in the Health Sciences Centre at the University of British Columbia.

The authors are grateful to the many people who have assisted in the preparation of this review. Special thanks are due to Ms. Debra O'Brien for preparing the manuscript for the press.

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Vancouver, B.C.
July, 1972

INTRODUCTION

The past decade has seen unprecedented interest and activity in continuing education for all professions. Nowhere has this activity been greater than in the field of health sciences. Health sciences centres, voluntary health agencies, professional societies and governments are just a few of the agencies who feel a responsibility in this field. The professional educator is now an integral part of the process and provides expertise that was lacking in the past. Medical schools increasingly recognize their responsibility for continuing education so it is less frequently treated as a poor relative of undergraduate and postgraduate education. Much needed research is being undertaken and searching questions are being asked. The idea of the continuum of education is accepted and curriculum committees are addressing themselves to the task of encouraging lifelong learners through curricular modification. Admission committees are addressing themselves to the selection of students with attitudes conducive to self-learning. All this activity has led to an increasing volume of literature which the authors have reviewed and analyzed in a way that will prove most helpful to all those with an interest in continuing education.

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December, 1972

TABLE OF CONTENTS

Page

INTRODUCTION iii

ACKNOWLEDGEMENTS iv

CHAPTER I PROLOGUE 1

THE HEALTH PROFESSIONS 3
NEW DIRECTIONS 5
CLARIFICATIONS OF TERMS 6
LIMITATIONS 7

CHAPTER II THE PROFESSION AND CONTINUING EDUCATION 9

PHYSICIAN COMPOSITION AND DISTRIBUTION 9
Work Patterns 10
Changing Patterns of Practice 11
NEED FOR CONTINUING EDUCATION 13
Early Developments 14

CHAPTER III PARTICIPATION IN CONTINUING EDUCATION 21

Field of Practice 22
Practice Arrangements 23
Location of Practice 25
Years of Practice 25
OPINIONS AND PREFERENCES 26
Deterrents to Attendance 26
Fees and Stipends 27
Scheduling of Programs 28
Sponsors 29
Instructional Processes 30
Felt Learning Needs 31
Other Information Sources 33

CHAPTER IV ORGANIZATION AND ADMINISTRATION 37

ORGANIZATION 37
Numbers of Courses and Sponsors 37
Course Content and Eligibility 39
Patterns of Course Organization 41

		Page
	SPONSORSHIP ROLES AND RESPONSIBILITIES	46
	Medical Schools	48
	Community Hospitals	50
	Medical and Specialty Societies	52
	PROGRAM PLANNING AND ADMINISTRATION	55
	Administrative Arrangements	55
	Instructors	56
	Finances	58
	Publicity and Promotion	59
	Programming	60
	CURRENT AND RECURRING ISSUES AND TRENDS	64
	Accreditation	64
	National Plans	66
	Incentives for Learning	68
CHAPTER V	INSTRUCTIONAL PROCESSES	73
	PATTERNS OF INSTRUCTION	74
	SMALL GROUPS	76
	Psychiatric Case Seminars	77
	Clinical Conferences	78
	Demonstrations: Supervised Clinical Practice	79
	LARGE GROUPS	83
	MASS MEDIA	84
	Radio Conferences	85
	Medical Radio Network	87
	Telelectures	88
	Television	89
	Encodes or Scrambled Broadcast TV	96
	Slow-Scan TV	98
	SUPPORTING DEVICES	99
	Motion Pictures	99
	Audio Tape Recordings	100
	Mediphone	103
	Correspondence: Programmed Instruction	105
	Computer Assisted Instruction	106
	ORGANIZATION FOR INSTRUCTIONAL TECHNOLOGY	109
	Regional	109
	National	112
CHAPTER VI	EVALUATION	115
	SUBJECTIVE ASSESSMENT	115
	OBJECTIVE ASSESSMENT	118

Page

Testing for the Achievement of Learning 118
Measuring Change in Performance 125
Measuring Long Term Results of Care 127
Program Models with Built-in Evaluation 129
PROBLEMS OF EVALUATION 134
The Problem of Objectives 134
Design Problems 135
Costs 136

CHAPTER VII SUMMARY AND CONCLUSIONS 139

SUMMARY 139
Participation 140
Organization and Administration 141
Instructional Processes 142
Evaluation 143
CONCLUSIONS 144

CHAPTER VIII EPILOGUE 147

PARTICIPATION 148
Attitudes 148
Motivation 149
Relevancy 150
PROGRAMS 151
Planning 152
Instruction 152
RESEARCH 153
CODA 154

REFERENCES 157

CHAPTER 1

PROLOGUE

One of the most conspicuous and indeed alarming features of modern life is the rapid growth, proliferation, and diffusion of knowledge in every area of human endeavour. This is having an impact upon individuals and social institutions more profound than one can conceive or readily accept. It is producing changes that erode cherished myths about education which destroys personal and institutional security.

Individuals can no longer enjoy the security that is based on levels of educational attainment for new knowledge quickly makes past learning obsolete. The higher the original level of educational achievement, the more quickly obsolescence occurs; consequently, the several professions are more significantly threatened by change. At the same time, the accepted roles of social institutions are undermined. As new knowledge permeates all segments of society it alters the function and purpose of each institution in its relationship to others and to society in general. The firmly entrenched institutions are most threatened since their security is based on traditional responses to problems which new knowledge has made obsolete.

To survive in a changing world, both individuals and institutions must continue to learn. Such learning does occur but as DeCrow* has noted, much of it

> ...is happening unintentionally, largely unobserved, and without the slightest conscious direction. It is happening of necessity, almost as a reflex motion of a society grappling with social forces which are remoulding a nation to confront the challenges of a rapidly changing world.

* R. DeCrow, "The Scope of Continuing Education.", Continuing Education (January, 1969) pp. 5 & 9.

But learning cannot be left to chance and without "...the slightest conscious direction." There is too much to be learned, too little time to learn it in, and too many distractions in the work-a-day world to ensure that the learning required will be achieved. In the past, such learning to keep abreast of new knowledge was thought to be an individual responsibility but few individuals accepted that responsibility so that the majority became obsolete and dysfunctional in a changing society. Consequently, it is becoming increasingly obvious that continuous learning is a responsibility that must be shared by both individuals and by society.

Some individuals and institutions have accepted this responsibility for continuing education more readily than have others and over a longer period of time. Adult education has been an integral part of society for centuries but for the most part it has existed outside the institutional structure as an activity of individuals concerned about their own personal need for systematic learning opportunities or with a philanthropic concern for the needs of others. It is only within the past century that educational institutions have begun to accept a responsibility for continuing education but not yet to the extent that it helps shape the self-image of the institutional role and function in society. At the moment, adult education is still largely a marginal activity.

The several health professions are just now becoming aware of their role in and responsibility for the continuing education of their members. For the most part this has been forced on them and accepted with some reluctance through fear of losing control of their own destiny to other forces in society. In implementing this newer responsibility the health professions have not modified their traditional perceptions of learning

and education in light of new scientific knowledge about adult education so that their continuing education programs do not usually achieve the learning and changes in behavior necessary for improved patient care.

THE HEALTH PROFESSIONS

The scientific and socio-economic factors accentuating the need for continuing education in the health professions has been well documented in many health manpower reports and by numerous leaders in the health field. Research is producing new knowledge in the health field at an unrelenting pace. Science has made massive strides in the understanding, cure, and prevention of ill health so that life expectancy has been increased two-fold. At the same time, it has become increasingly apparent that new and better means must be found to hasten the application of new knowledge for the improvement of health care.

An increasingly informed public aware of new discoveries and demanding them has accentuated the need to hasten the spread and use of knowledge. Higher education and income levels, as well as expanded coverage by health insurance schemes is shifting the role of the consumer as 'patient' to that of 'buyer' thereby strengthening his position to demand more and better health services. A growing egalitarianism now views health as a basic human right which should be readily available to all with equal quality.

In response to the changing nature of public expectations, universities and professional associations, joined by health service agencies and

institutions, are attempting to prevent obsolescence by increasing their involvement in continuing education. Although some interest and activity in continuous learning has long been the concern of some individual members of the health professions, it is only within the past decade that professional groups have concentrated their attention upon the provision of systematic educational opportunities for all in the professions.

In spite of this rapidly growing interest and concern it is everywhere apparent that continuing education is a responsibility not yet discharged satisfactorily or adequately at all levels. Moreover, as noted by Houle*:

> ...even more disconcerting is the expression of a growing public hostility toward the several professions because of the alleged incompetence or self-satisfaction of their individual members, faults which better continuing professional education might have helped to prevent.

Although the case is not clear, the view is expressed widely that continuing education in the health sciences suffers from a lack of clear purpose, an absence of professional interest, and incompetence in the provision and conduct of educational activities. There is also widespread the impression that programs are ad hoc or piecemeal instead of continuing, and designed along the traditional lines of youth education rather than taking into account that the potential participants are adults.

Whatever the crux of the problem, the general consensus is that present programs have many shortcomings and that newer and more effective approaches must be found. Recent government reports recommending that

* C.O. Houle, "To Learn the Future". Medical Clinics of North America, 54: 5-17, (January 1970).

"...professional associations explore the means whereby continuing education could be made a condition for practice..." have added a new sense of urgency to the task.

NEW DIRECTIONS

At present, programs for continuing education in the health professions are constructed largely on the model of academic pre-professional education which is controlled exclusively by subject matter and conducted primarily to disseminate information. This approach to learning stems from the prior educational experience of those planning the program as they generally lack sufficient knowledge about adult learning and instruction to do otherwise. Furthermore, as a result of their prior experience in pre-professional education, those for whom programs are planned resist educational activities that violate traditional conceptions regardless of their efficacy for learning. Since the traditional approach to education is not fulfilling the need, continuing education for health professionals must seek new directions.

In order to design new directions, it is necessary to examine existing activities in continuing education. This review, therefore, is a summary and analysis of the literature on continuing education in the health professions from 1960 to 1970 in order to provide a basis to seek new directions. By studying existing patterns of education for the professions it will be possible to avoid earlier mistakes and profit from prior experiences in designing functional educational programs.

CLARIFICATION OF TERMS

The term continuing education has been defined in various ways in the health sciences. Some definitions are broad and encompass all education following the completion of pre-professional programs in undergraduate study. In other cases, the term is defined in a very restrictive sense to apply only to short refresher-type courses. Still others use the term as a synonym of adult education to include all learning activities which contribute to personal growth and development.

As used in this review, continuing education includes any educational activity for health professionals "...through which opportunities for systematic learning are provided". Thus, any planned learning experience is included in this term and these range from formal courses through conferences, conventions, institutes, or workshops, to clinical traineeship so long as they are conducted for practising professionals and are systematic learning activities.

Instructional devices such as recordings, films, television, radio or programmed instruction are also included in this review where appropriate. For the most part such devices are used principally as information sources, to aid in self-instruction, or as ways of extending the range of an instructor to include widely dispersed participants.

The terms course and program are used interchangeably in this review and refer to those learning activities which are designed to achieve specific instructional objectives within a specified period of time.

Thus, a program may consist of a single instructional event such as an evening meeting or a one day institute, or it may be a sequential series of events occurring regularly over a period of time.

The terms method and technique are generally used interchangeably in the literature without specification. A method is a way of organizing the participants for the purpose of conducting a learning activity and may include correspondence study, classes, workshops, ward rounds, or clinical traineeships. A technique, on the other hand, identifies the behaviors that occur in the instructional situation which are intended to help the participant learn and includes such things as the lecture, panel, symposium, discussion, demonstration and similar actions.

Learning is used here to identify the process through which an individual acquires a new capability that is a more or less permanent change in behavior resulting from experience such as acquiring new information, a new skill, or an attitude.

The term instruction is used to identify the action of an agent who designs and manages a learning activity in order to achieve greater success in learning.

LIMITATIONS

This review is primarily concerned with basic program development for continuing education in the health professions. Most of the literature reviewed has been descriptive in nature covering a single program or a survey of program activities. There has been very little done in the way of sub-

stantive research and such as is available often fails to satisfy the rigorous canons of social science so that there is little validity or reliability in the data or conclusions presented. Perhaps if it accomplishes no other useful purpose, this review may spur the several professions to engage in research that is functional in answering the many problems identified in the literature.

CHAPTER II

THE PROFESSION AND CONTINUING EDUCATION

In keeping with the rapidly changing nature of science and society, medicine has undergone, and continues to undergo many changes, all of which must be reflected in education at all levels. In both Canada and the United States the number of active physicians has been increased over the past few decades, but this is offset by the fact that the number of patients seeking medical care has increased proportionately (171) (243). Morecver, despite the immigration of foreign doctors to maintain what is considered to be an optimum physician/population ratio, unequal distribution and utilization of physicians has created a disparity between demand and supply (171).

PHYSICIAN COMPOSITION AND DISTRIBUTION

An analysis of medical manpower in the United States reveals that the number of physicians employed in teaching, research, administration, and other activities unrelated to direct patient care, has been increasing in recent decades while the number in private practice is declining (171).

Changes in the pattern of providing medical care have also occurred within private practice. In the United States, the number of general practitioners*declined from roughly 50 percent of the total number of physicians

* As used in this study, "General Practitioner" refers to those M.D.'s with no specialty training and/or those with some specialty training, but who are not board certified, and who do not limit their practice to a single field.

in 1959, to approximately 31 percent in 1967. Current information on physician manpower in Canada reveals a similar trend. Whereas in 1965 the percentage of physicians in general practice was 67 percent, in 1968 the figure had dropped to approximately 54 percent (243).

Since some of the services formerly provided by general practitioners are being redistributed among the specialties, and other health workers (92) (134) (195), the implications of this changing pattern are not clear. Nevertheless, most reports stress the growing concern of both the public and the medical profession over the declining numbers of physicians in general practice, and many authors (96) (195) (257) reiterate the recommendation of the Millis report (163), that a new type of generalist be prepared who has graduate training in family medicine.

Of equal concern are the wide regional differences in the supply of physicians in relation to population. Doctors tend to concentrate in the larger urban areas and it is estimated that over one half of all doctors are presently practising in communities with populations in excess of 100,000 (257). This disproportionate distribution is also found at the state and provincial levels, varying directly with the per capita income and the proportion of the population in urban communities. Thus, while the physician/population ratio in Canada in 1971 was 1:723, British Columbia has the most favourable ratio of 1:638, followed by Ontario with 1:717, and Newfoundland with the least favourable ratio of 1:1,199.

Work Patterns:

A number of recent surveys (127, 232, 242, 257) disclose that physicians average a 56 to 63 hour work week, of which roughly 80 percent

is spent in direct patient care. The remaining 20 percent or less of the physician's time is spent in office administration, continuing education, medical society and hospital meetings, research and/or teaching. Contrary to the popular belief that office practice is decreasing, studies reveal that physicians average more than twice as many patient-physician contacts through office visits than they do through hospital visits (16, 127, 242). While generalizations cannot be made from the limited data provided, most authors agree with Somers (232) that "One limit in the doctor's productivity we have almost surely reached...the number of hours that he can be expected to work."

Changing Patterns of Practice:

Group practice, which brings together general practitioners and specialists who can share their expertise, facilities, and the services of supporting personnel, is a logical development to offset the fragmentation of care resulting from increased specialization (163). Such arrangements should also lead to the sharing of on call time, thus lessening the lengthy work week of physicians to some degree. Despite these advantages, the adoption of group practice has been relatively slow in both Canada and the United States (195) (232). Moreover, there is no conclusive evidence that group practice does in fact improve the efficiency or effectiveness of medical care (171).

On the other hand, the major development in the organization of medical practice has been the trend toward hospital based services (232). Without elaborating on the nature of this trend, it is worth noting that there has been an increasing number of articles and reports reflecting the

growing internal as well as external contradictions of the medical care system. There are many comments about the inequities in hospital privileges, interprofessional stresses and strains, and the soaring costs of hospital care (183) (196) (232) (243). Furthermore, it has been said that the hospital system is more producer than consumer oriented, and that it has been so busy "keeping in step with medical advances, that it has lost step with the medical needs of the community" (232) (252).

The charge is heard increasingly that while medical science now has the knowledge and technology to promote effective "health medicine", the bulk of medical practice is disease or cure oriented (195) (243). As indicated by the Task Force on Health Costs in Canada (243) "more than 95 percent of health costs are spent on hospital and medical care services, the treatment component, while public health and the preventive aspects constitute less than 5 percent."

The Report of the Committee on the Healing Arts (195) defines the problem in concrete terms:

> This is not the fault of the individual practitioners: most are already overworked in providing curative services. It is the fault rather, of a health system in which medical schools have failed to emphasize preventive health...and in which the rewards in income and professional status are relatively lower in this type of work than for other aspects of medical practice. Furthermore, and more importantly, the system is ill organized for the provision of comprehensive health care...The medical technology is now divided among poorly co-ordinated groupings of practitioners and agencies, specialists, general practitioners, hospitals, community services, and public health agencies.

The issues and problems of the medical care system are enormously complex and will not soon be resolved. At the same time, as noted by Storey (237) "any attempt to improve medical practice through continuing education must take into account the existing system, and relate effective education to that system."

NEED FOR CONTINUING EDUCATION

Three discrete phases of education are distinguishable in the field of medicine: undergraduate education leading to the M.D. degree; graduate education covering the interneship, residency, or other full time study leading to advanced academic degrees or medical specialties; and continuing education, comprising those activities engaged in by practising physicians "both to refresh the individual in various aspects of his basic medical education, and to inform him of new developments in his own and related fields of medical practice, but which do not lead to any formal advanced standing in the profession" (51). This third phase, frequently referred to as the "last undeveloped frontier of medical education," is the concern of this review.

The problem of keeping up with the research revolution is particularly acute in medicine where new developments are occurring, perhaps more rapidly than in any other field. The physician is confronted by ever increasing demands of a busy practice and by the omnipresent threat of obsolescence. Although organized medicine has invested money, manpower, and time, in attempting to help physicians keep current, the returns from this investment are now being questioned. Manning (145) and others (86, 194, 222, 275) estimate that only 10 to 25 percent of the practising physicians engage in continuing education despite the multitude of opportunities available to them. To what extent the quality and techniques of postgraduate medical education are responsible for this seeming disinterest is unclear, nor is it known how many of those physicians who do participate actually benefit from the programs offered.

Although much has been written about the nature of the problem there is insufficient reliable data to understand the problem.

Continuing education in medicine is not without its landmarks. Indeed, most of the problems being debated and the concepts currently considered to be new or revolutionary have been recognized and documented in a number of studies and imaginative reports published in the last half century.

Early Developments:

In his historical chronology, Sheperd (227) reports that prior to 1930, continuing medical education was largely directed toward correcting deficiencies resulting from inadequate basic medical education. It was not until the thirties, when the last of the proprietory schools closed and graduate specialty programs began to develop, that continuing education came to be viewed as the necessary "third stage in the life-long education of the physician." In 1930 and 1931, the University of Michigan, Albany College, and Tufts University, initiated planning for regional continuing medical education programs. Dr. Benjamin Horning's description of the early Michigan program defines precisely the concept of regionalization advocated today (108).

> The University of Michigan medical school has accepted the principles that graduate and continuing medical education should be decentralized and developed about the regional and community hospitals, and that medical education channels should extend from the medical schools out through such hospitals to the rural physicians.

A report by the Commission on Medical Education of the American Medical Association published in 1932 (227) noted:

1. That the education sequence from premedical education to retirement from practice be looked upon broadly as a single problem, not a succession of isolated and unrelated experiences.

2. That the continued education of physicians is synonymous with good medical practice, and provisions should be made ultimately whereby every physician will be able to continue his education. The time may come when every physician may be required in the public interest to take continuation courses to insure that his practice will be kept abreast of current methods of diagnosis, treatment, and prevention.

3. That the problems of postgraduate medical education are closely interwoven with those of practice and education. The great need at the moment is to secure joint leadership in a program which will embody the educational ideals and methods of the university and the highest type of medical practice.

Others repeating these admonitions and recommendations were J. H. Upham (250) in 1937, and Rappelye (227) in 1940 who also stressed the need for a critical re-examination of existing programs to determine whether they were meeting the needs of practising physicians.

A significant landmark in the historical evolution of continuing medical education was a program evaluation reported by Youmans in 1935 (280). Youmans made unannounced visits to 30 physicians who had attended his course several months earlier and by using a self-devised rating scale for measuring the quality of medical practice, he compared what he believed to be each participant's pre-course performance against his post-course performance. Although the small sample and crude methodology limited his findings, the study is important because it appears to be the first attempt at program evaluation using a research approach. Two observations by Youmans relative to the teaching-learning process were: "...the decided superiority of the practical over didactic teaching...It was very apparent

that the work which dealth with patients in the wards and in the out-patient departments or with various technical procedures of diagnosis and treatment, were the most valuable part of the teaching," and "The teacher of the physician student must possess not only knowledge but also a sympathetic appreciation of the problems and limitations imposed on the practitioners by a busy practice."

In 1938, the Council of Medical Education and Hospitals of the American Medical Association conducted the first national survey to determine the nature of existing postgraduate programs. The report of this study revealed that circuit type courses were being used in ten of the states visited (191). It noted that: "Under this arrangement, one physician or a team of physicians would spend from one to two months in a region of the circuit and then move on to a new area" and that "in-residence type programs were evident throughout the country...One, two week or longer periods of bedside instruction of limited groups with provision in medical schools and in hospitals for board and/or lodging, and intimate instructor graduate-student relationships characterize these short term residencies".

The most direct outcome of this report was the decision of the American Medical Association to publish a nation-wide listing of programs of continuing education available, "both as a service to physicians in selecting courses to attend, and as an aid to course sponsors in planning programs." While published first on a quarterly basis, it is now published annually as the "Annual Course Listing". This constitutes one of the major sources of information concerning the field of continuing

medical education in the United States. Thus, the decade of the thirties saw the emergence of a number of very modern ideas and several program innovations; nevertheless, according to Sheperd (227), educationally sound programs were the exception rather than the rule in terms of the nation as a whole.

Although a setback in the evolution of continuing medical education occurred with the onset of World War II, this is thought to have had some long range benefits in that it "forced the medical schools and hospitals to re-examine their programs with respect to their quality and quantity, and shifted the major responsibility for continuing medical education from the professional societies where it had traditionally belonged, to the universities and their medical schools" (168).

One major study of the early post-war which reflected a growing concern for the role of the medical school in continuing medical education was the 1949 Deitrick-Berson study (45) which was a national survey of medical school programs including continuing medical education. The recommendations of this report related to continuing medical education were that: 1) courses should be designed so that students can actively participate and their performance be evaluated; 2) courses should be increasingly located in medical schools; 3) medical school faculties should be increased to meet the increasing demands of postgraduate medical education; and 4) that accurate costs should be determined.

Probably the most comprehensive and significant national study on continuing medical education was that undertaken for the American Medical Association between 1952-1955 by Vollan (256). This study

included both the producers and consumers with information collected through observation, attendance at courses, interviews with more than 400 persons in programs of continuing medical education sponsored by over 200 institutions and organizations, and through a questionnaire survey of 5,000 responses from practising physicians. The major conclusions and recommendations of this study are summarized as follows:

1. Postgraduate Medical Education Lacks Direction:
   ...If postgraduate medical education is to develop soundly it is essential to have the major purpose clearly understood the specific objectives delineated, long range plans to obtain the goals, and effective leadership.

2. General Practitioners are Neglected:
   ...The greatest single need in this field today is for more and better refresher courses for general practitioners. These should be planned specifically for them in co-operation with local general practitioner groups.

3. Quality of Courses is not Consistent:
   ...This is largely due to undue emphasis on enrollment figures haphazard preparation of courses and the practical limitations that often obstruct educational ideals. This malady can only be corrected by an emphasis on: a) careful selection of faculty and definite responsibility of faculty for postgraduate education; b) systematic evaluation of post-graduate teaching methods; and c) eventually, some form of accreditation procedures may be necessary in this field.

4. Many Physicians Do Not Continue Their Education:
   ...The best potential cure for this condition is an improvement in the direction and quality of postgraduate courses so as to attract these physicians. The other factors to be considered include: a) arranging patient coverage while the physician is away; b) finding ways to attract the physician; for example, certificate, compulsory attendance; and c) developing the attitude and habit of lifelong learning in the undergraduate.

5. Physician's Time is Limited:
   ...The practice of medicine generaliy consumes 60 hours or more a week. Every effort should be made to utilize the time the physician can give to continuing medical education.

6. Postgraduate Opportunities are Too Few and Maldistributed: ...90% of the hours are concentrated in six states and most of these are in a few large cities...Postgraduate opportunities should be more equitably distributed.

Emerging from Vollan's study were a number of important items, notably a Guide Regarding Objectives and Basic Principles of Continuing Medical Education Programs. This publication, with minor revisions, now serves as the statement of standards for the field of continuing medical education (65).

Other important reports that followed Vollan's study, were those by Darley (70), Dryer (79), and Storey (237), all of which focussed on a national plan for continuing medical education. Although the recommendations of these reports have not been implemented, they collectively offer a sound framework for the establishment of a "university without walls."

CHAPTER III

PARTICIPATION IN CONTINUING EDUCATION

Organized systematic programs for the continuing education of physicians are not necessarily a new development but the tremendous growth in opportunities and interest has occurred recently. As yet there has been no definitive study of the educational activities of physicians but there have been a number of attempts to assess the amount of participation and the degree of physician interest. Some surveys have attempted to involve physicians in defining their own felt learning needs, and as well, to solicit their opinions with regards to how these needs might best be met. Most studies disclose that postgraduate courses are rated highly as a means of gaining new medical knowledge (117, 200, 256) but, at the same time, the actual extent of physician participation is not known. The oft quoted estimates of ten to twenty-five percent attendance are at variance with recent surveys which suggest a more optimistic thirty to fifty percent attendance rate (37, 117, 263). Recent reports from medical schools indicate a steady increase in enrollment figures over the past several years (54). While this increase may not accurately distinguish the number of individual physicians attending formal courses, it is felt that physician participation is probably somewhat greater than has been generally assumed (6, 37, 50).

Nevertheless, many medical educators express concern that there remains a hard core of physicians who never avail themselves of oppor-

tunities for postgraduate work and will not, unless attendance is made mandatory (6, 263). On the other hand, polls reveal that the majority of practitioners are of the opinion that attendance should be a voluntary matter and "they are concerned by the mounting pressure to make continuing education a condition for practice" (254, 260).

Field of Practice:

Most studies indicate that specialists devote more time to continuing medical education than do general practitioners (42, 177, 185, 256). Further, it is reported that specialists spend approximately five percent of their typical work week in some form of teaching and/or research, whereas general practitioners are said to engage in almost no formal teaching activities (42, 258). Vollan (256) attributed these differences, in part, to the longer period of formal education required for specialty practice, however, Peterson et al (185) found no significant relationship between the length or type of interneship and subsequent postgraduate study habits.

A recent California survey (37) found that when a detailed analysis of specialty practice was undertaken, a high percentage of the dissatisfied non-participants were found in select specialties, notably psychiatry, anesthesiology, neurosurgery, and other sub-specialties, while general practitioners expressed greater satisfaction with courses attended, and displayed greater interest in planned programs of continuing education. This study revealed that some specialists, particularly internists and surgeons (other than those in general surgery) attended courses often. The Indiana survey (117) disclosed no significant difference in attendance between generalists and specialists.

Practice Arrangements:

Although it is generally assumed that group practice encourages participation in continuing education, research findings do not support this assumption. At least two studies (37, 185) disclosed that while physicians in group practice were slightly better able to attend programs than were those in individual practice, the difference in participation was not statistically significant. In fact, one study found that while costs deterred relatively more physicians in solo practice from attending as many programs as they would like, more respondents in group arrangements said they limited their attendance because of difficulties in getting away from their practices.

Storey (237) notes that while 37 percent of the physicians mentioned too many patients as an obstacle to course attendance, only 21 percent listed the absence of a substitute physician as an obstacle. He attributes this seeming inconsistency to the traditional North American concept of "medical care as a personalized service provided by the private practitioner himself, and which therefore, cannot be easily delegated to others."

On the other hand, a recent survey by the Canadian Medical Association (196) provides some interesting figures relative to group practice and continuing education. As shown in Table I, these data suggest that group practice promotes not only postgraduate study, but even more important, it provides a great variety of less formal but ongoing opportunities for learning continuously.

TABLE I

QUALITY OF CARE PROCEDURE IN GROUPS
(Canada, 1967)

FEATURES OF GROUPS	NO.	PERCENT
Total number of groups	246	100
Member selection	240	98
Supervision of new members	204	83
Clinical conferences	151	61
Frequent consultations	239	97
Postgraduate study	226	92
Reference library	160	65

SOURCE: Report of the Committee on the Healing Arts; Volume 3, Table 29.5; p. 171. (196)

Menzel, Katz, and Coleman (154) disclosed that the adoption of new drugs occurred on the average of two months sooner where physicians shared offices, than where doctors practised alone. Both Clute (46) and Peterson (185) found that physicians themselves frequently mentioned group practice as a convenient and inexpensive means of consultation. Thus, while group practice arrangements may not necessarily be organized to maximize attendance at formal courses, it appears to provide conditions conducive to continuous learning.

Location of Practice:

Although physicians practising in rural areas no doubt experience more difficulty in arranging to attend programs, an increase in the size of the community does not necessarily correlate with increased participation in continuing education. Conversely, several studies (37, 185, 256) reveal that physicians in smaller cities and outlying districts attend courses more often than do those in larger metropolitan areas, and, when they do attend, they are more satisfied than their metropolitan peers (37). Rising et al (204) attributed the somewhat lower attendance in larger cities to greater dependence on hospital staff meetings as well as to the number of professional consultations available, while those in smaller communities must depend more on course attendance for new information and professional contacts. Both Vollan (256) and Peterson (185) made similar observations; however, they also found that physicians practising in the largest cities averaged the most hours per year in continuing education.

Years of Practice:

Age appears to be an important variable related to participation in continuing medical education. Both Vollan (256) and Peterson (185)

disclosed an age related pattern of participation that was characterized by a gradual increase in the percentage of physicians attending postgraduate courses as the number of years in practice increased which reached a peak in the fifth decade and declined thereafter. More recent reports reveal a similar pattern but with younger physicians averaging more regular attendance at formal courses (37, 177). Appel concluded that this trend is related to the realization by younger physicians that they cannot "coast along for the first few years in practice as could their predecessors twenty years ago" (6). Others suggest that this trend may be due more to deficiencies in basic medical education (15, 37).

OPINIONS AND PREFERENCES

Numerous studies have sought some measure of attitudes about continuing education and have attempted to identify factors in the provision of programs which may encourage or inhibit participation. These include such matters as fees, scheduling, instructional processes and content. Most of these factors lie within the domain of those providing programs, consequently the findings from such surveys can provide clues useful in planning.

Deterrents to Attendance:

The major obstacle to attendance is the inability to leave a busy practice rather than gross dissatisfaction with courses attended, or lack of available educational opportunities (34, 37, 39, 117). As might be

expected, general practitioners experience the greatest difficulty in getting away for additional study (37, 117, 200). At the same time, they express a greater need for it than do specialists who are more likely to feel that they can get needed information through alternate routes. One study (37) of non-participants revealed that 81 percent of those physicians in surgical specialties and 60 percent in medical specialties indicated "get information from other sources" as their primary reason for not attending, while only 30 percent of the general practitioners listed the same reason. The primary reason for non-participation given by this latter group was "time committed to patients."

Other deterrents to attendance mentioned by physicians included unsatisfactory scheduling of programs; costs; unsuitable subject matter (37) (117) (197) (229); lack of awareness of courses available (39); and, that the physician felt himself to be adequately informed and not in need of further study.

Fees and Stipends:

Most physicians prefer to assume responsibility for their own continuing education and are not adverse to tuition fees (37) (169) (204) (260). There is, however, less agreement with respect to receiving financial remuneration for course attendance. In the California survey (37), 39 percent of the respondents were somewhat in favour of stipends, 32 percent disapproved, and the rest were indifferent. Surgeons were least in favour of financial assistance, while general practitioners were most in favour. In New Jersey (99), while 40 percent disapproved of stipends, 11 percent approved, and 49 percent did not respond to the question.

Scheduling of Programs:

Physicians are overwhelmingly in favour of concentrated short courses lasting one week or less (37) (99) (107) (233) (256) (260) (266). Most indicate that either week-end or evening programs would be relatively easy to attend, but express a preference for week-ends (6) (37) (169). In two surveys practitioners gave as their first choice, Wednesday or a Wednesday-Thursday combination (114) (233). With few exceptions, they prefer courses held in their local communities (20) (99) (117) (266) but distance is not as much of a problem as the physicians' feeling of responsibility to his patients (185). Vollan (256) found that two-thirds of the physicians were willing to travel 100 miles or more, as long as the course was a relatively short one.

Opinions differ with regards to the place of meeting. Many doctors prefer to leave the interruptions of practice and hence give first preference to a university medical center (20) (192) (233), a local hotel (6) (192), or resort areas where they can combine education with recreation (37) (192). Others would like programs brought to their local hospital (117) (200).

Long term programs are not endorsed as uniformly as are short courses. There is some indication that physicians are becoming increasingly aware of the potential worth of lengthier in-hospital type training programs (6) (107) (192). In one study (37), three to six month clinical traineeships, and one to three week inservice programs were considered important by those who were familiar with them. Sim-

ilarly, in a very recent survey of psychiatrists (169), 38 percent of the respondents favoured an extended intermittent course offered over a period of from one to nine months.

Sponsors:

Specialty societies represent an important source of continuing education (42) (99) (117) (197). According to the California survey (37), courses sponsored by specialty societies were rated most highly by physicians, with those by medical schools rated second. Other agencies ranked considerably below these with local medical societies rated last. Approximately 41 percent of the respondents indicated a lack of familiarity with courses co-sponsored by medical schools and hospitals, and 38 percent were not familiar with courses sponsored by hospitals alone.

In contrast, a recent survey (200) co-sponsored by the Western Interstate Commission for Higher Education and the Mountain State Regional Medical Program (hereinafter referred to as the WICHE study) disclosed that in the mountain states, with the exception of Nevada, programs sponsored by local medical societies ranked first; hospital programs second; state medical societies third; and medical schools fourth. Other studies also reveal (42) (263) that programs sponsored by medical societies and national organizations are rated higher than those sponsored by medical schools. While these differences are no doubt due in part to regional variation in the availability of programs, Wenrich (263) suggests that it may also be related to the "town-gown" conflict. In his study, many respondents were of the opinion

that the physician teaching in a medical school had "lost touch with clinical reality."

Instructional Processes:

Physicians seem to prefer the more familiar instructional processes. Lectures, panels, seminars, clinic demonstrations, educational films, symposia, and grand rounds, are generally familiar and approved by most (99) (114) (200) (233). Although the traditional lecture has been criticized as a didactic, passive technique in a number of studies, doctors rate it first in their list of preferred techniques (37, 177, 169, 233, 239). Some physicians in Ruhe's survey (220) indicated that this was because "group discussions and question periods were often dominated by more vocal doctors who did not necessarily reflect the interests of the group." On the other hand, many physicians indicate that the exchange of ideas and information in informal conversations with peers can be an important reason for attending courses (212, 263). Two studies suggest that supervised clinical practice, which is rarely used at present, is gaining in popularity (37, 200).

Physicians also express interest in the newer uses of the mass media such as television, radio, and recordings, but they tend to rate them lower than the personal contact methods (37, 117, 263). While this rating may be due in part to the fact that these media are not always available in all regions (39, 99, 200, 212) in California, where all three media are used extensively in continuing medical education, responses indicate that they are perceived by physicians as supplementary when measured against the total spectrum of available methods and techniques (37).

According to a number of surveys, the least popular method of instruction is correspondence study (20, 37, 192). One study found that programmed instruction was well received (263).

In general, specialists indicate a preference for reading, teaching ward rounds, and other more clinically applied techniques (42, 117); however, there are considerable differences in the preferences listed by those in the different specialties. General practitioners prefer methods more compatible with a busy practice. They rate the mass media and bedside clinical courses in medical schools relatively high, as opposed to reading and long term clinical traineeships (37).

Younger physicians favour more participation (37, 117, 200). They are also better acquainted with the different teaching techniques and are more discriminative in evaluating their effectiveness. Thus in the California survey, while younger physicians tended to rate short courses higher than older physicians, they were less likely to consider them applicable to all subject matter than were their elders. With the exception of audio-digest which was ranked fairly high, they considered the mass media less effective than did their older colleagues.

Felt Learning Needs:

Surveys disclose that physicians want subject matter which is immediately practical and applicable to their particular practice situation (37, 84, 212). The most common criticism of non-psychiatrist physicians is that psychiatrist teachers do not understand their practical problems (34, 229, 258). Studies suggest that physicians attending

postgraduate courses in psychiatry want to learn concrete ways to diagnose and treat particular patients, and to increase their skills in communication (36, 217, 229, 233, 245). In short, practitioners are more interested in common medical problems rather than esoteric diseases and unusual procedures (37) (190), but this does not mean that they would ignore new developments (126). In one study, 54 percent of the respondents felt that insufficient attention was given to recent innovations in medical techniques. This opinion was more prevalent among generalists and those in medical specialties than amongst surgeons (37).

Physicians also want programs to deal with one or two topics in depth, rather than a broad coverage of several subjects (107, 126, 192). Specialists are of this opinion more often than generalists, but even the latter prefer more intensive coverage of content (37).

There is some evidence that practitioners would like refresher courses in the basic sciences (37, 107), but there is no general agreement on this. In one study some 90 percent of the respondents felt that basic sciences and clinical research programs should continue to be offered, but to a lesser degree (107). In another study approximately 69 percent of the respondents were in favour of more such courses, with specialists in medicine more favourable while general practitioners were least interested (37).

According to the California report (37), the subject matter most frequently requested by physicians relates to the diagnosis and treatment of disease. Moreover, physicians' interest pertaining to medical conditions is to a considerable extent specific to their area of special-

ization and place of practice (42, 229). Thus, in the Utah study (42) it was found that while endocrinopathies rated highest among all groups, and cardiac arrythmias second, these were ranked very low by surgeons. Similarly, in one area where the socio-economic level of the polulation was higher, all physicians displayed a greater interest in psychiatric subjects than did those from less prosperous areas. When individual practices were examined, great variations occurred in the physicians' perceptions of their learning needs.

At least two studies suggest that physicians would also like more courses dealing with medico-social problems, notably in the areas of "physician-patient relationships," and medico-legal problems (37, 67).

The Utah (42) and WICHE (200) studies indicated there was little correlation between a physician's expressed learning needs and those conditions most frequently encountered in medical practice. Of all groups, generalists were found to be the most realistic in relating educational needs to practice problems. At the same time, it was observed that a great deal of the practitioner's time was spent in treating minor ailments which could have been delegated to medical assistants.

Other Information Sources:

Harris reviewed the published research on the utilization of medical communication sources (111) and concluded that the majority of doctors were acquiring their medical information through visits from the pharmaceutical representative, direct mail, drug sample literature, medical journals, consultation with colleagues, and professional meetings, rather than through formal courses. Subsequent studies suggest that there has been little change. Although the detail man is generally

perceived as less valuable (117, 263, 265), medical journals, unsolicited literature, consultation with colleagues, and professional meetings, are utilized extensively by most physicians (117, 200, 263). At the same time, while physicians may use these information sources, they do not necessarily find them too useful (185).

Peterson et al (185) noted that the most common criticism expressed by general practitioners was that medical journals were too theoretical and the content not sufficiently relevant to medical practice. A more recent survey by Hamburg and Dohner (109) suggests that despite the passage of time, the opinions of generalists have not changed, with over 50 percent of the respondents rating current medical literature as of little use as a source of information in the field of urology. Nonetheless, Peterson and his colleagues (185) were able to show a positive correlation between the quality of a physician's practice and his interest in seeking new knowledge through the purchase of medical journals. Similarly, Wenrich (263) in identifying the characteristics of "gatekeepers" or educational influentials in one small community hospital, found that such physicians relied much more on written sources, informal consultations, and discussion with related health professionals in the hospital than did those physicians who sought their advice.

Although research on the use of informal sources of continuing learning is both limited and limiting (150, 275), Peterson et al (185) conclude, as have many others subsequently, "that basic medical education has been only partially successful in inculcating in future practitioners both the ability and the desire to seek out through a variety of

informal sources, greater knowledge and understanding of medicine throughout their professional lives."

CHAPTER IV

ORGANIZATION AND ADMINISTRATION

The recognition of the necessity for and importance of continuing education has grown steadily in recent years. The growth in interest and participation is reflected in the increased number of courses reported as well as the involvement of more and more institutions and organizations in the sponsorship of educational activities for medical practitioners. Along with the growth in opportunities and participation has come identifiable trends in the organization and administration of continuing education programs.

ORGANIZATION

A variety of patterns of organization are encountered in continuing education for medicine. These patterns are determined to some extent by the sponsorship of the program.

Number of Courses and Sponsors:

The number of courses available to physicians has been increasing over the past decade, with an average increment of approximately five percent per year from 1961 to 1970. In 1970-1971 there was an even greater increment of fifteen percent over the preceding year and this was accompanied by an equally sharp increase in the total number of institutions presenting courses.

TABLE II

CONTINUING MEDICAL EDUCATION COURSES

1961-1962 TO 1970-1971

Year	Total Number of Courses Reported	Number of Primary Sponsors	Courses Sponsored by Medical Schools		Courses Sponsored by Hospitals	
			Number	Percent	Number	Percent
1961-62	1,105	206	---		---	
1962-63	1,146	208	626	55%	104	9%
1963-64	1,264*	267*	760*	60%	163	13%
1964-65	1,569	251	857	55%	265	16%
1965-66	1,641	252	863	53%	351	21%
1966-67	1,608	262	910	57%	338	21%
1967-68	1,830	263	1,000	54%	224	12%
1968-69	1,922	300	1,024	53%	370	19%
1969-70	2,016	323	886	44%	441	22%
1970-71	2,319	303	813	35%	374	16%

*Includes courses offered by five Canadian schools not reported in other years.

SOURCE: J.A.M.A., 214:1526 (November 1970).

In 1968-1969, 372 institutions sponsored or co-sponsored courses and this increased to 611 institutions in 1970-1971 (54). These included 77 medical schools, 291 non-school or community hospitals, 50 city, county, and state medical societies, 66 specialty medical societies, 33 voluntary health agencies, and 94 "others," including schools of public health, postgraduate medical schools, private clinics, foundations, or local and national governmental agencies (61).

The major producers of courses have been the medical schools and community hospitals. As noted in Table II, medical schools alone produced over one half of all courses offered from 1961 to 1969. Although this decreased to 44 percent in 1969-70 and to 35 percent in 1970-71, medical school programs are still the most extensive in that the number of courses offered per school is far greater than the number of courses offered by other sponsoring agencies. Medical schools are reported to average approximately twelve to thirteen courses per school per year, compared with community hospitals which average roughly two courses per hospital per year (61).

Course Content and Eligibility:

For the past seven years the greatest number of courses have emphasized internal medicine, psychiatry, and general medicine, in that order (52) (54) (59) (61). Other major fields with a substantial number include surgery, pathology, opthalmology, pediatrics, obstetrics, and gynaecology (59). Despite this specialty orientation, over one half of the courses listed during the past five years have been open to both generalist and specialist. Because of the varying backgrounds and differing

learning needs of the two groups, one might question the wisdom of this, however, Ruhe (220) notes that the experience of medical schools discounts this concern as medical school courses are more often designed for a general audience. An exception to this is psychiatry where there is a tendency to provide different levels of instruction suited to the needs of non-psychiatrists (88) (231). At the University of Southern California, practitioners are offered three course levels: a basic, an intermediate, and an advanced course (88).

While it is impossible to determine the extent to which programs are designed for interprofessional education, the general impression is that the number is small (198). One program which appears suitable to an interdisciplinary approach is the "Care of the Premature Infant" which originated at Cornell Medical Center in 1949 (19). This program was designed for teams of physicians and nurses and the program model has been used in a number of centers in both Canada and the United States (19) (115). More recently, several Regional Medical Programs have reported successful multiprofessional programs on the "Management and Rehabilitation of the Stroke Patient." In most of these, physicians, nurses and physical therapists provide the team nucleus with involvement of occupational therapists, rehabilitation counsellors, and other essential health workers where these are available and required (252). Other fields of study reporting occasional interprofessional efforts are psychiatry (20), and public health (182).

Patterns of Course Organization:

In the annual listing of courses reported in the A.M.A. Journal, there are six major patterns of course organization:

1. Continuous courses are conducted over a consecutive number of hours, days, or weeks, but usually of short duration.

2. Intermittent courses extend over a period of time with a certain number of hours per week or month during that time.

3. Circuit courses are presented in rural areas by travelling faculty.

4. Traineeships are clinically oriented in-hospital residency type programs ranging in length from five days to one year.

5. Home study involves correspondence, programmed instruction, tape recordings and similar devices that enable the physician to study in his own time.

6. TV-Radio courses are similar to continuous courses but offered through the media of radio or television to physicians at home.

Of these six types, continuous courses appear to be the most common pattern as well as the most popular. In the four years reported in Table III these accounted for some 62.14 percent of all courses in 1964-65 with a high of 66.79 percent reached in 1966-67. During 1969-70 the 1261 continuous courses accounted for 65.54 percent of all courses offered with 83.74 percent lasting one week or less.

Intermittent courses were the next more frequent pattern with a high of 31.42 percent of all courses in 1964-65 but showing a decline to 26.86 percent in 1966-67 and a recovery to 30.95 percent in 1969-70. In that year these courses averaged 31 1/2 hours of instruction and appear to have the potential for providing more continuing instruction.

TABLE III

PERCENTAGE DISTRIBUTION OF CONTINUING EDUCATION

COURSES BY TYPE OF COURSE 1964-65 TO 1969-70

Type of course	Year							
	1964-65		1966-67		1968-69		1969-70	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Continuous	975	62.14	1074	66.79	1264	65.76	1261	62.54
Intermittent	493	31.42	432	26.86	555	28.87	624	30.95
Circuit	17	1.08	4	.24	15	.78	14	.69
Traineeships	55	3.50	65	4.04	54	2.80	77	3.81
Home Study	9	.57	16	.99	19	.98	14	.69
TV-Radio	13	.82	14	.87	12	.62	12	.59
Not Stipulated	1	-	3	.18	3	.15	8	.39
	1569	100.00	1608	100.00	1922	100.00	2016	100.00

SOURCE: Journal of the American Medical Association, 190:645, 198:232, 206:2051, 210:1523

Psychiatry makes the greatest use of intermittent scheduling because it is felt that instruction extended over a longer period of time is essential in changing attitudes and teaching psychiatric concepts. Currently, over 70 percent of all psychiatric courses are offered intermittently, and of these, a few extend throughout the whole of an academic year (59). This may account in part for the poor over-all attendance (217) (229) (245) since, as previously noted, busy practitioners find it inconvenient to travel long distances for a few hours of instruction.

Postgraduate Traineeships are offered by many hospitals without publicity, hence the number recorded in the Annual Course Listings may not be an accurate reflection of what is currently being offered. Of the 77 listed for 1969-1970, all were offered on a full time basis ranging in length from five days to one year. While 16 sponsors provided specific course dates, the remaining 61 sponsors left the scheduling to "be arranged" implying that enrollment was negotiable anytime throughout the academic year. In all but three cases, planned instruction was used in addition to clinical experience. Of the 68 sponsors specifying, only 10 limited enrollment to either specialist or generalist and the remainder were open to both groups. Fees varied from no fee, to $2,350 for one eight month experience in pediatrics. Over 80 percent of the sponsors were medical schools, with the Universities of Kansas and Maryland offering the greatest number and variety of programs.

In both Canada and the United States, physician interest in this type of program is said to be increasing, and a number of medical

schools report plans to expand their present offerings (8) (10) (35). Major deterrents to date have been the lack of university facilities; the chronic shortage of physicians; and the loss of physician income (189). A program of physician and housestaff exchange fashioned after the successful Tufts regional program has been suggested as one possible solution to these problems (23) (44) (47) (61). Another suggestion is Dimond's highly ambitious proposal calling for the establishment of a National Graduate Medical Center using one or more of the Veteran's Administration Hospitals. In this plan, practising physicians would be offered funded training positions at the Center for periods of one to twelve months. A permanent staff of proven teachers would be assigned to the Center and, in addition, outstanding practitioners would be invited as visiting clinicians (74).

At the operational level, a plan which has been implemented with relative success at Dalhousie University in Halifax (67), Staunton Clinic in Pittsburgh (186), and more recently, by the Washington/Alaska Regional Medical Program (71), is a traineeship offered on a part-time basis but extending over a fairly long period of time. The Washington/Alaska Regional Medical Program has organized a postgraduate preceptorship network involving sixteen university and community hospitals.

During 1970-71, the Faculty of Medicine at the University of British Columbia offered 21 different types of "Clinical Traineeships" in which 56 physicians participated and received 10,475 hours of instruction at an average of 187 hours to each person. The University

also has a "Clinical Clerkship Elective Program" for final year students through which they serve for 12 weeks at one of 29 community hospitals in British Columbia. Participating physicians in local community hospitals indicated that the students had an influence on their own continuing education study habits.

Circuit courses have shown a steady decline during the four years reported. Probably the most successful circuit program is that operated by the University of Kansas. For the past seven years, this program has offered six symposia in each of eight circuit centers distributed throughout the state of Kansas bringing continuing education to approximately 500 to 600 rural physicians annually (267). Another successful model is that operated in Michigan. Towsley (6) reports that in the year 1967-1968 programs were offered twice yearly in twenty areas with 1,033 physicians attending at least one of the two programs and 637 attending both. In Canada, the successful pioneer has been Dalhousie University which presently operates regional programs involving 34 centers, each of which received five or six visits per year from the Dalhousie faculty (15).

An extension of this circuit concept to include community hospitals (non-teaching hospitals, both rural and urban) as learning centers with ongoing informal and formal programs of continuing education, is what is receiving the greatest emphasis in the literature of postgraduate medical education today (85) (104) (215) (246). The implementation of Public Law 89-239, authorizing funds for continuing education developed co-operatively by medical schools and health agencies within the frame-

work of Regional Medical Programs (hereinafter referred to as (RMP) on heart, stroke, cancer, and related diseases, is reported to have been a major factor facilitating this trend in the United States (252). Presently, there are 55 RMP distributed throughout the nation, and some of them provide substantial evidence of the wisdom of developing continuing education as an integral part of health services.

Radio, television, and home study programs are few in number and have shown only slight variation over the years.

Another type of extramural program which deserves brief mention is the postgraduate cruise. As noted earlier, physicians indicate a preference for a program which combines a vacation with a limited amount of study. For a number of years Albany College (277), the University of Florida (267), and the Academies of General Practice (125) have sponsored such cruise programs, but the high cost and the time factor are said to limit their use (256).

SPONSORSHIP: ROLES AND RESPONSIBILITIES

While one of the strengths of continuing medical education lies in the diversity of agencies active in the field, at the same time the need for co-ordination and co-operative planning has become accentuated by the great proliferation of programs. In 1955 Vollan (256) concluded:

> There are over 300 different institutions and organizations in the United States known to be engaged in postgraduate medical education in one way or another. This diversity of sponsorship results in duplication of efforts as to the content, faculty, facilities, and scheduling of courses within

> given areas. The net effect is inefficient utilization of teaching resources and frustration on the part of the physician who has to choose from among a large selection of competing offerings. Although competition in itself is not harmful, in this case it results in wasted time, effort, and money.

In the intervening years, the number of sponsors has increased two-fold, and studies both on a national and regional basis merely reiterate the conclusion of the Vollan report (64) (114) (219) (230). In 1952, the Massachusetts Medical Society met this problem of duplication and maldistribution of courses by establishing the Postgraduate Medical Institute, which serves as a central clearinghouse and single source of information pertinent to all continuing medical education in Massachusetts and the other New England states (248). The California Medical Association established a similar statewide information service in 1964 which includes data projected three to five years on all California and Hawaii educational activities and as a further aid to planning courses, the association now publishes in its journal an annual summary of continuing education for the State of California (64).

With the exception of these, and a few successful co-sponsorship plans whereby medical schools, medical societies, and public health departments have joined forces to plan and co-ordinate continuing education for an entire state (207) (252) or region (6) (178) (252), the problem of co-ordination remains unsolved. Related to this problem and contributing to it, is that of defining respective roles and responsibilities. The history of continuing medical education is replete with illustrations of how the major responsibility for continuing ed-

ucation has shifted back and forth between medical societies and medical schools (45) (256) and, more recently, community hospitals and RMP have become involved also (6).

Medical Schools:

As noted earlier, medical schools have been responsible for over one half of the courses offered to practicing physicians over the past decade. While the number of schools involved has varied, the overall trend has been toward increased participation (54) (59) (61). Research data suggest that this involvement through continuing education programs does not necessarily indicate that the medical schools have made a major commitment to continuing medical education. In 1952, Norwood's survey (174) of eighteen medical schools revealed that while most of them regarded state and local medical societies as appropriately cast in the supporting role for educational activities administered by the medical schools, their own interest in continuing medical education was only casual. The majority of educators and administrators interviewed tended to favour the undergraduate and graduate programs, and to regard continuing education as an "extra chore." In 1963, Ruhe's study (220) of eighty-six American and twelve Canadian medical schools, disclosed that only twenty-five schools had programs rated "good" by the criteria outlined by the Council on Medical Education. The majority of program offerings consisted of isolated courses unrelated to one another and frequently lacking in specific objectives. Of the American schools, thirty-seven (43%) rated continuing medical education as a major responsibility, while four (33%) of the Canadian schools did so.

Krystal's more recent survey (135) of institutions providing continuing education for psychiatrists found that while forty-two responding medical schools felt that continuing education was the responsibility of universities, only nineteen departments of psychiatry were actually offering courses. Five departments were emphatic in stating that this was the responsibility of the professional societies.

Many writers suggest that medical schools continue to fall short in fulfilling their leadership role in continuing education. Each admonishes the university medical schools for not recognizing their responsibilities in the field (6) (137) (208) (230) (240) (246). From such writing one gets the impression that the medical schools have exerted very little effort indeed; but this is misleading as many medical schools have been steadily improving their programs and establishing more effective administrative arrangements for continuing education. In the United States this trend has been fostered by Public Law 89-239, but even without Federal aid this increasing involvement of medical schools would continue. In Canada, a number of universities report an increasing trend toward co-operatively sponsored programs, more often involving medical schools and hospitals or medical societies (8) (14). Also reported are plans to implement programs sponsored jointly by medical schools (10, 11).

Still to be resolved, however, is the question of national co-ordination, and perhaps even more important, the question of how much responsibility medical schools should and/or can assume in the continuing education of practising physicians. Probably Hudson (120) best summarized the present position and future role of the medical schools:

> Many faculties have a sense of obligation to contribute to continuing education...But in the face of shortage of funds and personnel and overwhelming teaching and research commitments, there is an equally strong feeling of frustration that to take on more would be impossible. The fault is not that a great deal can't be done...it is being done. The models exist but an example here and there is not adequate to demonstrate the fact that physicians must have easy access to current information that can be used for the benefit of their patients. In future, I believe it is inevitable that universities and their medical schools will assume a major share of responsibility in the field of continuing medical education. A major share is not the whole of responsibility. I hope that the periphery may co-operate with the center by trading ideas and personnel in such a way that the teacher learns and the students teaches, and that there will be an exchange of fact and knowledge for wisdom and experience.

Community Hospitals and RMP:

Since community hospitals are widespread and utilized by most physicians as part of daily practice, considerable attention is now being directed toward their development as the major foci of continuing medical education (216) (269). It has been emphasized that if the regular hospital staff conferences, committee reviews, consultations, and other routine day to day activities were effectively organized, these could serve as the means through which continuing education could become a built-in component of medical practice (188). Even more importantly, there is a growing consensus that the hospital setting is the one place where the quality of medical care could be assessed if an ongoing program of current case medical audit were enforced (85) (139) (225).

On the other hand, physicians in practice may not share these views. Werch's study (264) of five community hospitals revealed that while all five utilized regular chart reviews, the prime objective was

only to meet the minimum standards of hospital accreditation. In many instances, there was a general "hands off" policy, and even gross errors were overlooked and not criticized constructively. This study also disclosed that consultations were more often used simply as a way to transfer patients to another physician or service, and rarely was there an exchange of medical viewpoints. Similarly, Fox and Robertson's review (103) of eighty-six Consultant's Letters found that only 30 percent of the reports included relevant new information or reinforced existing information which might have been of educational value to the referring physicians. Moreover, in not one case was a reference cited.

Wenrich's study (263) in one community hospital disclosed that since hospital by-laws required active physicians to participate on review committees, and made attendance at hospital staff conferences compulsory, "whatever their educational value, they were viewed by physicians as administrative obstructions, designed to police the practice of medicine." Wenrich quotes Dr. N. Stearn as saying, "educational activities at the local level can be successful only if individual physicians see themselves not only as physicians but also as teachers, and are willing to assume some responsibility for preparation, participation, and presentation."

The phenomenal growth of separate hospital departments of medical education in recent years is viewed by many authors as a significant development which will facilitate this trend (104). As a relatively new educational activity, the role and function of these administrative units is not clearly defined and in many instances, medical

education directors devote only a few hours a week to continuing medical education (25) (188). Moreover, the response of individual hospitals to this new and more demanding role is variable with some even resisting attempts by medical schools to assist the hospitals in developing their own ongoing programs of continuing medical education (14) (188).

The 1967 Planning and Goals Conference sponsored by the California Medical Association (188) recommended:

1. That community hospital medical staffs be encouraged to organize a committee to study the problems of continuing education. This should not be confused with the regular program committee.

2. That the CMA should communicate with hospitals to inform them of educational assistance that is available. For example, some hospital staff do not know that some medical schools will help them with planning hospital staff meetings.

3. That the CMA encourage community hospital medical staffs and medical schools to enter into experimental projects designed to discover feasible relationships that might be developed.

Recent reports by the Council on Education of the American Medical Association (59) (61) suggest that some progress has been made in these directions. As previously mentioned, RMP have in many instances served as a stimulus in encouraging community hospitals to assume a more significant role, and in turn to seek assistance from the medical schools, Some RMP are themselves now being charged with developing "parallel offerings not necessarily complementary to those of universities and component societies" (6).

Medical and Specialty Societies:

Historically, local and state medical societies were the pioneers of postgraduate courses for physicians (191). Although still active in the field, their programs have been declining steadily. According to

the Council's Annual Reports (54) (59) (61) general medical societies are presently averaging one percent or less of the total postgraduate hours of instruction reported. At the same time, national, state, and local meetings with an educational component are reported on the increase, but the general consensus is that most medical society programs lack co-ordination and continuity, and that the business and social functions frequently take precedence over educational activities (256) (263).

Although many medical societies are presently re-assessing and attempting to improve their current programs, others are questioning their role as producers of continuing education (6). At a recent discussion this view was advanced (268):

> Leadership as a learned society is passing from medical society to hospital staff...I do not hold that this is good or bad, simply that it is happening. Local groups that are highly organized are perhaps better able to carry out programs of continuing education than medical societies which may have many component bodies concerning themselves with education, thus having confusing re-duplications. The role of the medical society is really the co-ordination of this kind of activity, the development of a multi-phasic approach, including medical colleges.

An application of this is illustrated by the activities of the California Medical Association. In addition to co-ordinating course offerings and accrediting programs for the State of California (187), the Association is conducting Regional Medical Institutes in cooperation with several of the state's medical schools. To further assist the medical staffs of community hospitals in developing effective continuing education programs, the Association recently published a supplement to the American Medical Association's Guide (38), and is operating a pilot project to examine the potential role of the community hospital.

In contrast to general medical societies, specialty societies are well established as purveyors of continuing education. For the past several years they have averaged from eleven to twenty percent of the total hours of instruction reported (52) (61). While their offerings are few in number in comparison with medical schools, the number of physicians attending specialty courses almost equals the attendance reported at medical school programs. Thus for the year 1968-1969 (54), specialty medical societies and Academies of General Practice offered collectively 467 courses which were attended by 29,590 physicians at an average of 63.36 per course. In contrast, medical schools offered 1,128 courses with an attendance of 34,106, at an average of 30.24 per course.

Despite this seemingly successful performance, specialty medical societies are presently receiving the same criticism that is directed at medical school and general medical society programs. In short, it is said that their programs are episodic, and that the relevance of "one set of presentations to others, either within the meetings themselves or relative to other meetings, often is strikingly lacking" (230). Miller (159) adds still another dimension to the problem:

> The incredible success of modern preventive and therapeutic measures in medicine is changing the basic nature of medical practice. The growing host of aging patients, of those with chronic debility or disease, calls for a kind of care that is less readily measured by precise instruments or in precise units. The "Recent Advances..." in dealing with these problems are as often provided by behavioral scientists are by those from the purely biologic disciplines; the subtleties and complexities of patient care in this context are only beginning to be elaborated by serious students and have yet had little impact upon

> practitioners or the educational programs offered to them. It will require the most skillful leadership to introduce such important components of the contemporary social fabric into the instruction of physicians whose focus has for so long been the disposition of acute problems...

PROGRAM PLANNING AND ADMINISTRATION

The literature pertaining to program planning and administration is limited to medical schools, consequently, this section is confined to arrangements within schools of medicine.

Administrative Arrangements:

In all articles on the organization of continuing education in schools of medicine it is recommended that there should be a clearly defined department or division with a full time director responsible for the overall program (38) (207). This ideal has been achieved in but a few medical schools.

In 1963, Ruhe (220) found that while 54 American (62.8%) and 6 Canadian schools (50%) reported having a department, section, division, or standing committee for the planning and implementation of continuing education, only 5 American (5.8%) and 1 Canadian school (8.3%) had a formally recognized department identified in the Directory of the Association of American Medical Colleges. Moreover, while 57 American (66.3%) and 7 Canadian (58.3%) schools reported a part-time person responsible for continuing education, in only 3 American (3.4%) and in no Canadian schools was there a full-time director or head. As late as 1967, Sullivan (240) noted that of the 65 medical schools offering courses

in the Annual Listing, 20 percent had a listed department or division of continuing medical education.

Reporting on the current accreditation program in the United States, Ruhe (218) identified the lack of central authority as one of the major problems facing the accreditation committee. It has been found that in many institutions programs are developing within schools or hospitals with little co-operation among departments. Even where there is central authority, in some institutions the responsibility for the development of educational programs is left to individuals or groups rather than planned on a departmental basis. As a result, educational offerings are said to range from excellent to poor.

In Canada, a 1968 survey (241) of medical schools disclosed that twelve of the fourteen responding schools had an established department, division, section, or standing committee on continuing education. The remaining schools reported persons assuming this responsibility on a part-time basis, ranging from one quarter to three quarter time. On the other hand, all fourteen responding universities indicated that the postgraduate division or section assumed major responsibility for the selection and arranging of course content under the direction of an appointed chairman.

Instructors:

Courses sponsored by medical schools are taught largely by members of the regular faculty or by guest lecturers from other medical centers. Non-academic physicians or non-medical personnel are utilized far less frequently (45) (220) (241). A view gaining strength is that

practising physicians should be encouraged to participate in teaching, thereby involving them in their own continuing education and at the same time alleviating some of the excessive demands made on the medical school faculty. The evolving role of the teacher as consultant in regional programs (208) probably illustrates best the successful implementation of this approach. The pilot project reported by the Tufts New England Medical Center (210) utilizes residents as teaching consultants in several of the small community hospitals in Maine which is another innovative and promising program model.

Despite the trend toward greater utilization of clinicians as teachers, with the exception of psychiatry teacher training programs are still sparse. In psychiatry, short training courses for program directors and teachers have been undertaken by a variety of groups including: WICHE; the American Psychiatric Association; The National Institute of Mental Health's Continuing Education Branch; The American Academy of General Practice; and others. In a recent editorial, Stratos (238) reports that the Psychiatry and Medical Practice Committee and the Physician Education Project of the American Psychiatric Association plan to expand consultation services and intensive teacher training sessions for those involved in teaching psychiatry to non-psychiatrists. From the general field, a recent proposal by McMaster University plans to provide a visiting teacher program in which both practitioners and consultant from the region will work in the McMaster clininal teaching units to update their clinical skills (11).

Although there is a growing interest in the need to improve the quality of instruction in the undergraduate medical training program, this has not extended generally into continuing education. The feeling that proficiency in medicine is the principal prerequisite still persists without regard to teaching ability or to the amount of learning achieved by participants. Some moves are underway to improve the quality of instruction by providing clinicians with training for the instructional role.

Finances:

Financial support for continuing education varies widely from school to school (220). In general, the major sources of revenue are tuition fees, some government health grants, and donations (8) (14) (135) (274). The percentage of the medical school budget devoted to continuing education is almost negligible. Nevertheless, since most schools do provide facilities as well as faculty time, their contribution is not insignificant (45).

Some medical schools attached to state universities receive additional funds from the legislature and state health departments. Others support their programs through contracts with community hospitals, some are financed by fees charged for individual programs, or consultation services to other institutions (9); still other programs are managing to break even or to operate at a modest profit almost solely on tuition and the contributed services of the regular faculty (9) (45) (55). Professional associations, voluntary health agencies, federal training grants, pharmaceutical firms, and philanthropic soci-

eties all contribute significantly to continuing education in medicine (8) (12) (45) (55) (207).

More recently, particularly in the United States, the federal government has provided greater financial assistance to continuing medical education. Childs (44) noted that projects supported by government have proven effective in accelerating the development of more innovative programs of continuing medical education.

Publicity and Promotion:

In the United States, sponsoring institutions may publicize their course offerings through the "Annual Course Listing" published each year in the early August issue of the Journal of the American Medical Association. In addition, medical journals in both Canada and the United States publicize selected course offerings. Other traditional methods of advertising programs include posters, direct mail and personal announcements (241).

A number of state medical societies (6) (64) report the use of a special continuing medical education bulletin. One such, which is mailed to physicians and hospitals in the New England States, announces all formal programs offered in New England including essential information as to their time, place, and tuition (248).

In Canada, the University of British Columbia (8) publishes an annual listing of courses offered by the Division of Continuing Education in the Health Sciences. This is mailed to all physicians in the province to assist practitioners in planning their personal programs of continuing education well in advance.

Because these publications are often overlooked by physicians, some course sponsors are using reinforcement through personal visits to physicians (222) (269) and newspaper, television, or radio announcements (11) (269).

Programming

In spite of all these efforts to promote continuing medical education, the problem of relevance is thought to limit the effectiveness of most programs offered (84) (173). Those expressing this view suggest that programs ignore the interests and expressed needs of practising physicians. Reports from medical schools suggest that many use questionnaires extensively to test the market for continuing education (220) (241). Indeed, as early as 1952, Norwood (174) found that it was a common practice for medical schools to send out request forms on which physicians could note their suggestions for courses.

Many programs are not designed with clearly defined objectives and, as Miller (159) indicates, in the process of implementation physicians' "wants" may become confused with or subordinate to what the programmers "want or think the practitioners need." Moreover, "unless the teacher is careful to determine where his students are in their learning... and requires them to exhibit some understanding of each step before proceeding on to the next, a program of greatest relevance may end as a collection of nonsense syllables with carefully concealed irritation and disappointment on both sides."

Sodeman (230) has stressed that the ideal program is "an individual one built to suit the specific requirements of each physician,

and perhaps a few more like him." The obvious implication of this principle is that the programs most likely to succeed are those which involve the learner in the planning process. That present organizational structures and administrative patterns are unable to meet this required is implied in the many critiques on continuing medical education (104) (219) (225) (246).

Several recent experimental programs have attempted to involve the consumer in planning programs. MacLeod (144) reports a successful self-sponsored and self-administered course on internal medicine at the Yale-New Haven Medical Center. Although initiated as an annual review for internists preparing for board examinations, this program has evolved over the years into an ongoing comprehensive review of the whole field. While the main criterion of "success" has been measured largely in terms of increased enrollment (from 26 to 60 physicians over four years), in the words of MacLeod:

> The growth of this highly structured yet informal review course appears to have been a function of the relevancy of the course material and a sensitivity to the changing needs of the group. The principles of student participation in planning and administration, and continuous feedback through questionnaires, served as the basic framework for the organization of the course. These principles are important considerations for others desiring to set up such a course and merit emphasis by the American Medical Association's Council on Medical Education in setting standards for accreditation of institutions providing postgraduate courses.

Another experimental project which points out the need to consider alternative administrative arrangements for programming, is that reported by Torrens (246) of St. Luke's Hospital in New York City. In this project, a specially created hospital department called The Community

Physician Relations Office was established in order to assist non-affiliated general practitioners with patient referral problems and concurrently to offer continuing education programs specifically designed to meet the day to day problems encountered by physicians in their local practice. Initiated to offset the increasing isolation of general practitioners from the specialist oriented teaching and research hospitals, this program has resulted in increased utilization of the hospital's referral services as well as the teaching conferences and grand rounds which previously the general practitioners had ignored as "of little use to them in their practices." Torrens recommends that "other teaching hospitals establish a similar office or department to serve as a single place to which the community physician knows he can turn for assistance with problems of patients in his practice, and from which he can obtain information about patients he has referred to the teaching hospital for care."

Webster and Ozarin (262) describe a program in North Carolina in which a circuit riding psychiatrist made regular visits to all physicians in five counties and was available at any time physicians wished to consult him about cases. During the first two years in which this project was in operation, the number of admissions to the state mental hospital from this five county area decreased whereas admissions from other counties increased. The program is being expanded throughout the state as an adjunct to community mental health services.

The preceptorship project sponsored by the Washington/Alaska RMP is another example of a program specifically designed to meet the learning

needs of individual physicians. The physician requesting a preceptorship is asked to outline what he wishes to learn and to indicate whether he wishes a structured program or one with free study and conferences. The planner uses this information to design an individualized program of studies for the physician. The evaluation of the program is based on the objectives stated originally by the physician. To date, 92 percent of the physicians who have participated in the program are reported to have satisfied at least three-fourths of their educational objectives. Although no statistical evidence was offered to show improved patient care as a result of the program, Davidson et al (71) noted that "In this type of program, the physician is able to satisfy his own educational needs which makes his experience relevant to his practice."

Under the auspices of the Oregon RMP, Meighan and Burg (152) are investigating the effectiveness of an experimental project in which health professionals in two Oregon communities are given an opportunity to develop their own educational programs on the care of the stroke patient. This is based on Miller's "process" model which assumes that before adults learn they must recognize their need to know, and that this is best accomplished by involving them in identifying problems and seeking solutions. To implement this, "stroke study groups" were formed, membership of which was interdisciplinary representing all health care professionals available in the communities. The study group task was to "identify existing barriers to the delivery of optimal stroke care and then to design educational programs to surmount them...

The project staff participated as facilitators enabling the groups to work together in identifying local educational needs or in planning programs..." To date, two groups have planned community programs which differ widely in objectives and approaches. One of these groups has submitted a proposal for a grant to continue the program independently when the experimental project ends. Meighan and Burg question "whether such a group can function without administrative assistance from outside the community..."

CURRENT AND RECURRING ISSUES AND TRENDS

Despite the many unresolved issues and operational problems, continuing medical education is thriving. Concurrently, a number of developments are occurring which can be expected to influence future trends but there is still many issues that require the attention of the profession.

Accreditation:

Since the publication of the original "Guide" in 1957, the American Medical Association has been working on a voluntary system to accredit institutions sponsoring programs of continuing education. In 1961, its Council on Medical Education appointed an advisory committee, and under its direction a number of site surveys were conducted to determine the feasibility of such a plan (219). As a result of the study, an acceptable program of accreditation was proposed and approved by the Association's House of Delegates. In 1967, formal accreditation was initiated (81). By September 1970, 86 institutions and/or organi-

zations had been accredited and listed as such in the Annual Course Listing. Ultimately, only accredited courses will be included in this Annual List. In this way it is hoped that programs of inferior quality will either be improved to meet accreditation standards or discontinued because physicians do not attend them (61).

The "Guide" provides the criteria used by the survey teams responsible for accrediting programs (65). The California Medical Association has adopted this "Guide" as the statement of basic principles for its proposed accreditation of programs (187). Briefly stated, these criteria are:

1. There should be ADMINISTRATION of the continuing education program by a responsible person having the respect and support of the professional staff of the organization or institution.

2. The BUDGET should be adequate to the educational program undertaken to its continuing improvement. Sole dependence on tuition fees tends to restrict unduly the quality of continuing education programs.

3. The TEACHING STAFF should consist of physicians and their associates of proven ability, training, and experience.

4. The CURRICULUM of any continuing medical education program should be designed to explore with considerable depth one subject or a closely related group of subjects. The educational merit of devoting sufficient consecutive sessions to explore more than superficially the background and advances in one subject is emphasized.

5. There should be available FACILITIES that encourage participative methods of education.

6. The EDUCATIONAL METHODS should include more than a series of lectures or panel discussions in which the physicians are primarily passive recipients. Emphasis on problem-solving is likely to increase student involvement.

7. METHODS OF EVALUATION of the effectiveness of continuing medical education programs should be developed and used as part of each program.

8. Each PHYSICIAN'S REWARD for participation in continuing medical education always should be his improved ability to care for his patients and the stimulation of his own spirit of intellectual adventure.

While it is too early to predict the long term effects on this accreditation program, it is generally viewed as a non-restrictive regulatory mechanism which will ultimately provide some direction for the development of the field (61).

National Plans:

Darley and Cain (70) proposed in 1961 the establishment of a National Academy which would centralize the nation's education resources for continuing medical education thereby helping to co-ordinate and further its development. Subsequent to this, the major national medical associations formed a Joint Study Committee to consider the development of such an Academy. The Committee's report, written by Dryer (79) proposed the creation of an Academy which would be a "university without walls." Under this plan, a national agency would develop a core curriculum "responsive to the needs of the nation's physicians." Using mass communication media, these ongoing comprehensive programs would be focused nationally, regionally, and locally, and physicians would be able to choose those programs which would best meet their individual needs. Among its many far sighted recommendations, the report emphasized that..."a partnership of our major medical resources will give strength to all which none possess separately, and that such an efficient balance

can be organized to articulate and reinforce national, regional, state, and local plans."

Following the publication of this report, the American Medical Association undertook to pursue such a plan and under the leadership of Storey (237), an intensive study of physician's needs was begun in a pilot project in Utah. In 1966, this project was discontinued because it was felt that local and regional conditions were not ready for such a large scale undertaking.

The many highly imaginative and creative ideas inherent in these reports are germane. The Interuniversity Communications Council founded in 1965 by Darley and a small interdisciplinary group of university people was a product of the original plan for the establishment of a National Academy. Similarly, Dimond's proposal for the creation of a National Graduate Medical Center would have this Center serve as the base for Dryer's "university without walls" (73). The most recent proposal was that outlined by Bloom (6) and called the AMA Plan. In summary it notes:

1. Among all forces involved, the American Medical Association would be the appropriate leader in continuing education, implementing an intimate partnership with universities or medical schools and Regional Medical Programs.

2. In this way, the AMA would expand its present programs to approve existing offerings and stimulate new efforts in its constituent state societies.

3. What is needed is clear statement of the AMA role as a natural partner with RMP in assessing needs and evaluating performance, and as a natural partner with universities or medical schools in continuing education.

4. Further, the AMA should formally invite others to help design and join a new sector for genuine collaboration in all aspects of continuing education.

   This could be called the "health professions education council"; with regional, state and national components; each composed of AMA, university and RMP elements (plus any other pertinent representation).

   This sector would guide operations of a total system from identification of needs to curriculum to programs, to evaluation and feedback.

   The existence of this device would interrupt current separation where AMA, RMP, universities, various professional societies and multiple other forces proceed unilaterally in continuing medical education.

Incentive for Learning:

Under increasing public pressure, many leaders in medicine forecast that the problem of maintaining professional competence in physicians will result ultimately in periodic mandatory relicensure. In the absence of valid criteria for measuring "professional competence", the medical profession remains divided on this issue. An ad hoc committee of the AMA's Committee on Education proposed recently that regular participation in continuing medical education should be the condition for relicensure, but the only concrete action the AMA has taken in this respect is to offer a 'Recognition Award' to physicians participating in continuing medical education. For those physicians wishing to qualify, "the requirements are 150 credit hours of continuing education in a period of three years, 60 hours or more made up of required educational activities and the remaining 90 hours, in electives" (184). According to most accounts, physicians have responded well to this voluntary accrediting

scheme and at the completion of its first year, more than 14,000 physicians are reported to have qualified for the award (61).

The California Medical Association is issuing a similar award of a "Certificate in Continuing Medical Education" but has extended the scheme to cover a wider range of informal educational activities. Upon receiving this Certificate, physicians automatically qualify for the AMA Physician's Recognition Award (128). Since its inception, the Academy of General Practice has required participation in continuing education as a condition for membership, and recently the Oregon State Medical Society followed this lead by making regular participation in continuing medical education a condition for membership (182). There is some concern being expressed as to how much effect this loss of state medical society membership would have on the chronically non-participating physician. Many feel that such physicians are better "under the umbrella of organized medicine than outside it" (6).

Stein (236) reports that "while the general subject of re-examinations and re-certification of licensed physicians has been repeatedly discussed by the Federation of State Medical Boards and by the National Board of Medical Examiners, no definite decision has been reached." The newly established American Board of Family Practice has stipulated recertification every six years (55), and recently, the American Board of Internal Medicine announced its intention to implement a recertification procedure (118).

The American College of Physicians has devised a voluntary examination for internists which serves as a self-assessment test. It is hoped that this will help an individual internist become more aware of his deficiencies in medical knowledge so that he will seek ways to correct them. Initially, 5,000 of the 150,000 ACP members took the test, and since that time, an additional 5,600 members and non-members have participated. According to Rosen (213), the reactions to the examination have been enthusiastic. More recently, the American Psychiatric Association (40), the American College of Pediatrics (69), and other national specialty associations (142) are reported developing similar programs.

Commenting on the varied approaches currently being tried in an effort to ensure professional competence, Miller (159) writes:

> The purpose of licensing is to certify that competence has been achieved, not to spell out the method of achieving it, or equating participation in a specified number of wholesome activities with achievement of the goal. The American Academy of General Practice has already done so and is often commended for the courageous decision that made participation in accredited programs of postgraduate education a requirement for continued membership. One can only applaud the motives that led to this decision, but the thoughtful may question the philosophy underlying it and the practices accompanying it. For the spirit of this resolution seems to say, that having led a horse to water, you can make him drink.

In the same vein, a recent statement issued by the Committee on Medical Education of the New York Academy of Medicine (55) concludes:

> ...that certificate concept, if judged only on the basis of total number of hours in some kind of postgraduate course is fallacious is that it implies unwarranted merit to course work. The committee also strongly opposes any mandatory examinations for maintenance of the currency of one's medical license. The available information does not support a positive relation between the results of most such tests and the quality of care provided by practising physicians for their patients...

Accordingly, this committee recommends: "the establishment of programs based on management type or audit type procedures whereby both hospital and community physicians may participate in mass audit exercises, reviewing each other's charts or record room charts generally, to indicate features of particular diseases which must be considered and appropriate approaches in their management."

Whatever the merits and/or limitations of these varied approaches, clearly the trend is "to give recognition for participation in continuing medical education" (61).

CHAPTER V

INSTRUCTIONAL PROCESSES

In the literature describing programs of continuing education in medicine, the terms applied to instructional processes are used indiscriminately and without either precision or consistency. Since the descriptions of the processes are inadequate to allow translation into the standard terminology of adult education it will be necessary to summarize the literature as presented rather than attempting to synthesize it.

Among other things, the reports of programs do not clearly differentiate between the methods and techniques employed (255). Nevertheless it is possible to identify the major methods. The most used method is that of the course or class with three major variants or patterns of this method being the continuous, intermittent, and circuit courses described earlier. Other methods encountered include ward rounds, case seminars, clinical conferences, clinical practice, and the discussion group. The literature in which these methods are discussed is primarily descriptive and there is scant evidence of attempts to assess the effectiveness of the methods nor to compare one with another.

The techniques of instruction reported are equally poorly defined and described so that terms describing methods are used interchangeably with those identifying techniques. Furthermore, instructional

aids or devices are often treated as instructional techniques. The resultant confusion in language makes it virtually impossible to assess the comparative effectiveness of various program designs with any validity. It is clear that those conducting programs for continuing education in medicine are not knowledgeable about how learning occurs in adults or the conditions essential to achieve learning, nor are they skilled in the design and management of instruction.

PATTERNS OF INSTRUCTION

While no one technique can be thought to outweigh all others in importance, those which facilitate the immediate application of knowledge are generally considered to be superior to those in which the learner is a passive recipient of information. In continuing medical education one of the greatest problems has been the excessive use of non-participative or didactic techniques.

In 1940, Rappelye (227) stated, "too often postgraduate medical instruction has been given solely by didactic lectures...while didactic lectures are valuable, demonstrations, firsthand experience under guidance, and conferences are the most successful forms of teaching. Any well conceived program should stress these methods". This recommendation, variously expressed, was repeated by Norwood (174), Vollan (256), Dryer (79), and in many other reports. In 1957 the Council on Medical Education incorporated the recommendation in its Guide, along with a lengthy explanatory section on specific ways to increase participation in learning (65).

In the meantime, courses reported in the Annual Listing have consistently publicized the use of a wide variety of participative techniques. Thus the Council's review of the 1964-1965 Annual Course Listing revealed that of the 1,529 courses listed, only 22 percent specified the use of solely didactic formats defined in this survey as "the lecture, the lecture and brief discussion period, or these plus panel discussion and audio-visual aids" (57). Using the same restrictive definition, of the 2,016 courses listed in 1969-1970, roughly 20 percent indicated the use of only non-participative techniques. All other specifying the lecture and such things as the seminar, laboratory work, or clinical conferences (59).

These figures alone are misleading, since the majority of courses in continuing medical education are both short term and for large groups. When enrollment reaches the hundreds, and time is limited, it becomes extremely difficult to incorporate a variety of techniques which would facilitate active learner participation (57). It is not surprising therefore, that in actual practice, while the purely didactic format is no longer reported (220), the majority of sponsors still make use of the lecture, symposia, panel and other didactic techniques (129) (267).

The Council's survey in 1956-1957 revealed that a significantly larger proportion of courses sponsored by medical and specialty societies used solely didactic techniques (57). More recent accounts suggest that the situation remains relatively unchanged, but the structure and quality of programs is said to vary considerably according to the particular society involved (263). Thus, the California Medical Society is reported

re-shaping its programs to facilitate greater physician participation and in 1968, seven regional postgraduate institutes were held with 885 participants but with a faculty-student ratio of 1:10. Similarly some of the national medical conferences and conventions are also reported using more small group methods such as seminars or clinics (230) (263).

Rhue (220) reported that in 1963, 43 percent of the responding medical schools indicated that they were using the lecture alone or lecture plus question period; 21 percent live clinics; 20 percent group conferences and seminars; 9 percent laboratory work; and 7 percent bedside rounds. A more recent unpublished survey of Canadian medical schools reveals similar findings (241).

In both Canada and the United States, the expansion of regional programs suggests that greater use will be made of small group seminars, specialised clinical practice and other more participational techniques in the future (235).

Of the specialties, psychiatry has consistently offered the greatest number of courses with enrollment limited to small groups (arbitrarily defined as any learning group with 25 participants or less) and, as previously noted, it makes the greatest use of intermittent scheduling (59).

SMALL GROUPS

The small discussion group referred to variously as the seminar or clinical conference, is widely used in continuing medical education

but, as previously noted, surveys disclose that many physicians prefer the formal lecture. Sheeley (226) reports an experiment in which an institution offered the same psychiatric course simultaneously by two different methods: a series of lectures and a series of discussion sessions. The lecture series had over 25 registrants while the discussion series attracted none. Since acceptance and active participant involvement are two primary factors in the effectiveness of the discussion group method, it may be useful to illustrate its use.

Psychiatric Case Seminars:

In reviewing the varying results of a psychiatric course for non-psychiatrists held in three Washington counties over a three year period, Stuen and his associates (239) concluded that many physicians are not capable of taking part in the free give and take of the psychiatric seminar which can be a traumatic experience initially. They recommend beginning with a didactic approach then gradually shifting to the study of case materials and the use of discussion. In Brooklyn, Brody (31) found that by keeping the group under ten, even the most "diffident physician actively participated in discussion."

Reporting on the psychiatric case seminar used in the four state Utah project, Mead and Fishman (151) concluded that the degree of physician participation was directly related to his familiarity with psychiatry, thus those physicians who most needed help with their cases were least likely to receive it. He also concluded that concentrating solely on cases from the physicians' practice resulted in insufficient preparation in basic methodology so that the Utah project was modified to include lectures as well as case oriented discussions.

To circumvent the problem of a physician's reluctance to discuss case problems in the psychiatric group setting, the program in Elmhurst, New York incorporated an hour's consultation service prior to each seminar, as well as offering individual psychiatrist consultations by appointment (22).

Commenting on the current widespread use of their original psychiatric case seminar technique, the Balints have emphasized that "such ventures, no matter how greatly modified, require much more time than the popular week-end G.P. course" (17).

Clinical Conferences:

One of the more intensive types of clinical conferences reported is the consecutive case conference (CCC) devised by the American Heart Association. In this, a panel of experts analyzes the charts of ten patients consecutively discharged. The physicians are required to account for their conduct of each case as it comes under review. Although Williamson and McGuire (270) stress that the purpose of the CCC is educational, namely, to provide "an opportunity for physicians to reflect back on their own performance and to gain insight into the management of the case with the help of acknowledged experts", most writers agree (254, 263, 282) that it requires considerable ego strength on the part of the practising physicians. A study by Williamson and McGuire (270) which compared the relative effectiveness of the CCC and the lecture in improving clinical judgement, found "no overall significant difference as tested by simulated patient problems six months after completion of the instruction."

More successful programs using this approach have stressed the anonymity of individual physicians and focussed on group problems and group problem solving (97, 161, 235). Vaneslow (254) quotes Slee as saying that some medical directors have committed "professional suicide because they failed to take into consideration the worries of the medical staff regarding the possible consequences of a program of this type."

Far less threatening and therefore widely used in community hospital programs is the clinical conference using the physicians' own case material as a basis for general discussion. Cudmore and Tippett (67) reported a preliminary study that compared the results when one group engaged in extra preparation prior to a visiting teacher program and another did not. Follow up interviews with physicians revealed that the amount or preparatory work undertaken by the two groups did not differ significantly despite the extra encouragement given to the experimental group.

At McMaster University a time log is kept to determine whether there is a progressive change in the amount of discussion time used by the visiting faculty versus the learner group. Results to date have shown no significant increase in the time utilized by the practising physicians participating in the program (11).

Demonstrations; Supervised Clinical Practice:

In psychiatry a number of courses are reported which combine the case conference approach with patient demonstrations, return demonstration, and supervised clinical practice. In these programs feedback provided through the use of the two-way mirror and/or vidoetape

serve as the basis for group discussions (26) (28) (274). Also reported from this field are successful uses of psychodrama and role playing (26). A typical example is that described by Levinson (140) in which the physician participants re-enact patient situations prior to and following their clinical experiences. Fleisher (98) reports that at the University of Southern California, professional actors have been trained to play the role of patients. This device has been developed further at Michigan State College and the University of Colorado where preliminary work indicates a fairly reliable degree of objectivity on the part of the actors, thereby suggesting that an assessment of student learning could be possible.

In contrast to the foregoing, Kern et al (130) at Johns Hopkins University have described an experimental project in community psychiatry using what they call "The Demonstration Week" in which practising physicians experience the same unstructured field work as that used in training residents. This has been evaluated by physician responses to questionnaires which suggest that this technique is placing responsibility on the physicians for their own learning and, in an ambiguous situation requiring frequent changes of style and roles, is capable of fostering self-learning and an attitude favourable to implementing change.

A number of programs reported also provide evidence of a movement from the classroom to the clinical practice field. Richardson (202) described a visiting teacher program conducted in one small community

hospital in Pennsylvania in which a consultant allergist visited the allergy clinic every two weeks. At this visit, specialized techniques were demonstrated. The local physicians practiced the techniques under supervision and formulated therapeutic plans for selected patients. Between clinic sessions, the local staff physicians implement the proposed treatment plans. It is the aim of this program to decrease gradually the number of consultant visits and increase the transfer of responsibility to local physicians.

Similarly, St. Justine's Children's Hospital in Montreal has reported a consultation service in which two to three pediatricians spend two days in a community hospital. In the morning they meet with family physicians and do ward rounds, reviewing all cases. In the afternoon they see outpatients whom the family physicians present for examination and consultation. According to Rosier (215), this experiment is proving fruitful, "not only in continuing medical education, but also as a way of providing the public with the services of a qualified consultant."

Goldfinger and Federman (106) have described a successful refresher program in which three general practitioners served as housemen in the emergency department of a teaching hospital while receiving formal lectures and supervized clinical instruction on the latest intensive care techniques. While this program illustrates the typical traineeship in most respects, what is of particular interest is that the emergency nature of the ward responsibilities automatically defined the physicians' real learning needs. On the other hand, Brown et al (33) described an experimental project

at Pacific Medical Center designed to retrain inactive physicians in which it was found that the conventional traineeship program was inadequate for a group who were not only reluctant to assume patient responsibilities, but also required a systematic review course using didactic instruction. They recommend that the curriculum for physicians in this case should consist of two phases: first an intensive review course on basic aspects of clinical medicine and second a program of supervised patient contact with a gradual assumption of responsibility.

The only report of an ongoing inservice training program encountered in the literature was that described by Jampol and others (124). Sponsored by 60 physicians in group practice, this program utilized small group bedside sessions with emphasis on clinical diagnosis and the management of the participant's own patients. A follow up medical audit after two years indicated that, in general, "more appropriate laboratory and X-ray studies were being ordered in problem cases, with less tendency to initiate therapy before diagnostic studies." Consultant specialists also felt that better patient assessments were being performed prior to referral and that referral notes displayed a fuller understanding of the problems involved.

Using a simulated coronary care unit at the Pacific Medical Center, the Washington/Alaska RMP is conducting regularly scheduled classes on coronary care for multiprofessional health personnel. The equipment used for classroom instruction and which is available for loan to other centers conducting similar programs include: tapes and

monitors for teaching the arrthymias; A.V. presentations (slides; film cartridges; and filmstrips) on the care and treatment of heart disease; and computer programming on various coronary care topics. In conjunction with these classes, consultative services are provided and post-graduate preceptorships are arranged for physicians (261). This program has been rated so highly that other RMP are reported developing similar or modified programs (252).

LARGE GROUPS

Instruction provided to large groups must focus on techniques which will enhance participant interaction. Despite the widespread use of large groups, there are few studies reported that involve such groups. The two descriptive studies selected for this review are particularly informative.

Harshbarger (112) investigated a community mental health workshop attended by some 80 individuals from various health professions. He had participant observers gather data on the pertinent issues discussed in the small buzz groups and a comparison was made of the observers' summaries and the reports made by each buzz group to the total group. Their findings revealed that while stimulating and meaningful problems were raised in the small group sessions, these were not reported back to the total group. Instead, "professional overpoliteness" characterized most of the reports. This study concludes: "If workshops are to be creative forums for new ideas, the traditional roles of the various

professional participants must be disrupted." The recommendations stress the need for more effective feedback mechanisms such as that provided by participant observers who would ensure that the essential contrasting professional viewpoints would be relayed to the larger assembly for further discussion and clarification.

Schlesinger and Feil (221) reported a questionnaire evaluation of a three day symposium on epilepsy presented to a diverse group of physicians and other health workers. They found that the highest mean rating was given to the didactic format and the lowest to exchanges between speakers, panelists, and the audience. They also report that there was a discrepancy between the objectives of the participants and the content of the program. Furthermore, while general practitioners were relatively satisfied with the program, specialists expressed dissatisfaction with the broad coverage of subject matter. The nurse participants expressed a high degree of interest in all topics yet, the author noted, "the subject matter was geared to physicians and much of it was only indirectly relevant to the nurses' interests." One may infer that the findings of this study merely reiterate one of the basic problems inherent in large learning groups--"How wide a net should be cast, and how large should the opening be?"

MASS MEDIA

The radio, television, and the telephone are three of the most ubiquitous communication devices in North America. All three of these

have been used for many years to diffuse new medical information to physicians but it is only recently that they have been adapted to provide systematic instruction. These media provide a way of extending the range of an instructor to many groups and obviate the necessity of forming a specific instructional group at a specified location with an instructor present in person. In some respects, they have been used more extensively in continuing medical education than in any other subject area. This is due, no doubt, to the fact that the potential participants are clearly identified and the motivation to learn is generally high. Unfortunately this pattern of instruction has not been studied adequately.

Radio Conferences:

A most noteworthy innovation in continuing medical education has been the two-way radio conference pioneered by Woolsey at Albany College in 1955 (279). In the typical program, physicians gather around a combination transmitter and receiver set located in their community hospital. Following a brief lecture by medical school personnel, physicians in the participating hospitals take turns in submitting questions and comments to the lecturers. Frequently, slides and other supplementary materials are distributed to the hospitals in advance to be used in conjunction with the program. Initially, 21 hospitals were linked with the medical college. In the fourth year of operation, five New England Medical colleges and their affiliated hospitals were participating in the network. Physicians in affiliated

hospitals were provided with an opportunity to listen and to direct comments and questions to faculty experts from six different medical colleges. In 1963, Ebbert (80) estimated that approximately 1,298 physicians in 36 hospitals were being reached by these radio conferences. In addition, the number of uncounted physicians who listed to the programs was thought to be considerable. The cost to each participating hospital in the Albany Network is $700 per year per hospital. This fee covers more than one hundred programs and the supplementary instructional materials. Woolsey (277) also describes a new program format being offered co-operatively with six medical schools in 15 participating states. This program is presented as a medical case which the physicians first analyze on a special form listing a variety of possible tests and procedures. After each participant has decided on his diagnosis and treatment, the instructor analyzes the case and presents his approach to the problem. When the presentation has been completed, physicians discuss the case management via two-way radio. Preliminary studies suggest that physicians become more skillful in their diagnosis after experience with this approach to case management.

Farber (95) estimates that more than 800 physicians within a 500 mile radius are participating in the programs conducted by the University of California School of Medicine. More than 1,510 copies of lecture notes and case presentations are mailed each week to participating hospitals. Many hospitals tape the programs so that physicians may hear any broadcast at their convenience. To date, the findings of the California experience show that the greatest response has been from

general practitioners. Farber concludes: "medical radio conferences have been a major step forward in bringing the most recent concepts into outlying districts with a minimum of expenditure."

There have been few, if any, meaningful evaluations of the effectiveness of two-way radio conferences. The only objective evaluation found was that undertaken by Richardson et al (201) in 1963. This study attempted to evaluate a radio series through the use of before and after tests for knowledge gain. Using a sample of 70 volunteer physicians who had participated in the program, and a control group consisting of 12 non-participants, Richardson was able to show a statistically significant mean score difference of 1.6 between the first and second tests for the experimental group, and no statistically significant difference for the control group.

The medium of radio has scarcely been used in Canada for continuing medical education. The only report of a viable program encountered was from the University of Alberta. In 1968, a series of twenty-one radio seminars were offered. These were considered to be successful, so it was planned to extend the broadcasts (7). As a part of its proposed Multi-Media Information Retrieval System, the University of Saskatchewan plans to establish a province-wide radio-telephone series in co-operation with the C.B.C. (13).

Medical Radio Network:

Aitken (4) reports the establishment in Boston of a Medical Radio Network which broadcasts musical programs into the participating

physician's office twelve hours a day. The music is interrupted every hour by a fifteen to thirty minute medical program to which the doctor may listen, with three opportunities each day to listen to each of the four programs offered.

Telelectures:

A pilot project to provide continuing education to physicians via telelectures or amplified telephone at the University of Wisconsin has been described by Meyer et al (156). Initiated in 1965, seventy hospitals are linked by private telephone lines to the University Medical Communication Center. The general program format follows that used with the two-way radio conferences, including a brief lecture with slides followed by a discussion period. Participating hospitals take turns submitting questions and comments. In the 1967-68 academic year 80,000 hours of instruction were given with "neither faculty nor students moving away from their communities or their health care responsibilities." Fortney (101) reports that the Missouri RMP has established a similar telephone network linking many of the remote hospitals in Missouri with the university's medical center.

The South Carolina RMP is offering consultant conferences in the field of malignant diseases of children via statewide telelectures. Plans are underway to make videotapes of patients as well as of special diagnostic and therapeutic procedures which will be sent to each of the participating hospitals. Simultaneous viewing will then be possible during the conferences (166).

In contrast, Lyons (143) reports limited success in the Central New York RMP experiment with telephone networks. Among the many technical problems discussed, he notes that faculty unfamiliar with the method are often uncomfortable talking to an unknown audience and that physicians are equally reluctant to ask questions. He notes further that nurses and medical technicians have made greater use of the network than have physicians.

Television:

During the past fifteen years, television has probably received more attention than any other medium. Referring to its use in continuing medical education, Ohliger (176) states, "Mass media courses for the medical profession are blossoming all over the map, but mainly in the United States," and he quotes Moses as saying, "Educational television has proven to be immensely useful in keeping doctors abreast of advances in medical practice..."

Despite all the publicity surrounding its varied and widespread use, closer scrutiny reveals that the use of television has spread rather slowly (193). Moreover, much of what is in use is still experimental (111). Since Harris (111) has reviewed so recently the published literature on closed circuit systems, this report is concerned largely with the use of open circuit, standard receiver, and scrambled or encoded broadcast television.

In 1954 Warner and Bowers (259) reported the first use of open circuit television in postgraduate medical education at the University

of Utah. The program consisted of a series of medical clinics and was telecast over a commercial station in Salt Lake City, that had a range which included 75 percent of the practising physicians in Utah. In order to minimize public viewing, off air time was used and publicity was restricted to direct mail to the physicians. To promote participation, an unlisted telephone was installed and physicians were encouraged to place questions by collect calls. The success of the experiment was attested by favourable physician ratings of the program, high participation by more rural physicians, and no adverse criticisms from the lay public. This resulted in the regular use of open circuit television for continuing medical education by the University of Utah. After that experiment, Wayne State University, the University of Texas, the University of Oklahoma, and others began telecasting similar programs on an experimental basis frequently using tapes made at the University of Utah (43).

Commenting on the instructional techniques used in these early programs, Castle (43) notes:

> While the method of presentation has varied from illustrated lectures, panel discussions, question and answer periods, and demonstrations of procedures and patients...the approach most frequently used has been informal discussion between two teachers with liberal use of visual aids to demonstrate and emphasize salient features of the presentation.

A slightly different approach at the University of Florida was reported in 1963 by Michael (158). This program consisted of a grand rounds type of presentation in which three local physicians served as one half of a panel in one studio in Jacksonville some sixty-five miles

away, with the other half consisting of faculty members located in the studio at Gainsville. A micro-relay system provided an opportunity for an exchange of questions and answers following a case presentation in the Jacksonville studio. This approach was felt to "bring the university to the bedside teaching" and it was concluded that this type of conference was highly desirable.

In Pittsburgh particular efforts have been made to involve local hospitals. In 1962 a series of regular weekly broadcasts consisting of "live" grand rounds and closing with a brief medical newscast was initiated in 29 community hospitals. In 1965, Moses and Wolfe (167) reported an expansion of this program to include 63 hospitals extending throughout the tri-state area of South Western Pennsylvania, Eastern Ohio, and Northern West Virginia. In 1967, 70 hospitals were participating in this network (176).

A televised lecture series called "Boston Medical Reports" was launched in 1964 taking as one of its principal objectives, "the regionalization of medical education by means of television, expecting it to become a part of a proposed university without walls." In this network were stations in Maine, New Hampshire, Massachusetts (209), and more recently, Rhode Island and Vermont (176). One noteworthy element of the series was the "Physicians' Notebook for the Boston Reports." Intended as a promotional attraction, prior to the telecasts a copy of a three ringed notebook with informative materials announcing the series, its purpose and format was mailed to all potential viewers in

Maine. Subsequently, supplementary literature accompanying each lecture was sent to physicians to add to the notebook which could then serve as a reference source. Another important element of this project was the effectiveness studies which "provided continuous feedback to program planners so that they could modify future programs."

Although attempts at an objective evaluation of the series were hampered by limitations of the research designs, it was felt "that Boston Medical Reports did provide a review of medical topics and for some viewers, significant learning did take place." Moreover, it was felt that "the series launched a strong movement toward a greater use of mass communication techniques in New England," including the initiation of a similar series entitled "New England Dental Reports for Continuing Dental Education." In addition, it pioneered an effort at regional co-operation and presently a special package of 42 programs entitled Medical Reports, Boston, Buffalo, Pittsburgh, is being offered by the Eastern Educational T-V Network to its member stations.

The total cost of each program was approximately $4,000 or about $4 per potential viewer and between $10 and $12 per actual viewer in Maine. Increasing regional distribution decreases costs and the estimates of the number of viewers per program range from 9 percent to 38 percent of the potential physician participants. Robertson and Pyke (211) conclude: "Size of target audience must be weighed against cost, including time and effort to produce and broadcast television programs...If the target audience is small, television, a mass medium, may be less monetarily efficient and educationally productive than other instructional methods."

The Oregon Medical Association in 1966 sponsored a broadcast television series produced by a committee of seventeen members of the association. By placing this reponsibility on its active membership, it was hoped that practitioners would become more involved in planning their own continuing medical education. The series entitled "The Oregon Medical Review" was broadcast weekly from January to April and focussed on content relevant to the role of the first contact physician. A study was made through mail questionnaires and follow up telephone interviews, using a representative sample drawn from the potential viewing audience of 1,651 physicians. This disclosed that while the first five programs attracted relatively large numbers of viewers, interest was not maintained. The maximum number of physicians viewing any one program was 10.4 percent of the membership. From responses to the telephone interviews it appeared that the involvement of the membership of the Association in programming was achieved in theory only, perhaps "because the television committee...in their concern to get the job done, permitted the development of an organizational structure that was just as distant from the average member and involved just as hierarchic patterns as the sponsorship of other programs of continuing medical education." Moveover, it was found that the program planners frequently used individuals who were unable to adapt to the television medium. Even more important, was the failure to identify specific instructional objectives for each program. In conclusion, Meighan and Treseder (153) noted: "The medium provides a means whereby programs of

continuing medical education may be distributed widely; it seems to offer some outstandingly attractive features. However, further study of educational effectiveness is required to show that these outstanding attractions are not illusory."

In 1963, the New York Academy of Medicine began presenting on open circuit television its weekly Clinical Science Seminars for physicians. The purpose of this project was "to ascertain the acceptability and effectiveness of television as an additional medium for continuation medical education in a metropolitan area." Through repeated polls, the size, composition, and opinions of physicians participating in the program were studied. In addition, the study sought to determine the impact of the program on its audience by means of an information test which was administered to 100 viewers and 100 nonviewers covering a period of from four to eight months after the presentation of selected programs in the series. While the findings of this study were somewhat clouded by time variables, the results indicated that no specific learning could be demonstrated (147). Cumulatively, polls revealed an audience averaging only 305 or 4.8 percent of the potential viewers that was attracted to the series regularly (148). Considering the expense and effort, so small an audience did not justify continuing the program, so it was terminated in 1968.

Fahs and Miller (94) described the evaluation of a program broadcast in the state of Minnesota between 1967 and 1968 in which nine programs of the series were analyzed from three points of view:

1) the accuracy and recognition of scientific information; 2) the success in communication; and 3) the relevance of the programs to the care of patients. Four panels of physicians who were specialists in the areas covered by the programs were selected to make the evaluation. A comparison was made also of the actual and potential viewing audience "with information on why physicians did not watch and what insights came to those who watched."

Since objectives for specific programs were not clearly defined, the panelists were hampered in their attempts to evaluate them. In general, the scientific content of the series was judged to be adequate, reliable, and accurate. With respect to communication and technical production, the comments of the panels were unmistakably negative. As one panelist put it, "These gentlemen communicating with each other about their own habits of practice just don't convince me that I want to emulate their style." Another concluded, "One program could have been put on audio alone with no need for vision. The appearance of the panel, unless its personalities are dynamic, is less than worthless."

Comments from viewing physicians suggested that "a considerable amount of program testing occurred, and where one program was useful to the physician in his practice, he tried others. Conversely, when he received no benefit he quit watching. And the more programs the physician saw, the clearer it was that he was getting something out of the series." The major reasons given by physician for not viewing were: not knowing of the program's existence, forgetting to watch, or being too busy. Some also indicated that they preferred to watch the ten o'clock news. The authors conclude:

> No one doubts that continuing medical education through television has potential. However, few believe that its full potential is presently being utilized, and virtually all are willing to experiment to some extent. This evaluation reaffirms such generalizations and hopes that continuing effort be applied to both new and old methods.

A number of medical centers in Canada have reported some experimentation in the use of broadcast television for continuing medical education (11, 119, 253). The general impression gained from the literature is that most Canadian productions have followed the typical American format: namely, lectures or panel presentations followed by a brief question and answer period. As in the United States, the problems of technical production, costs relative to viewership, and difficulties in evaluating the worth of televized programs, have been identified as the major obstacles in the use and expansion of the medium (119, 253).

Encoded or Scrambled Broadcast Television:

While no studies encountered to date have revealed specific reactions from lay viewers, the question of complete professional privacy is still being debated within the medical profession (263), and this has resulted in a network of medical schools and affiliating hospitals in California using scrambled or encoded broadcast television (30) (165).

Under this system, the picture appears on the standard television screen, but in encoded form thus preventing public viewing. Decoding or unscrambling is accomplished by a modified receiver. Because these decoders are still relatively expensive they have been placed only in the affiliating hospitals in the California experiment.

This is believed to have several advantages: 1) it makes the community hospital the center for continuing medical education, 2) it makes feasible an accurate record of the number of viewers of each program, and 3) it makes it possible for the universities to charge a tuition fee for participation in the network, which in turn makes superior production techniques possible (30).

The success of an initial pilot project linking 15 community hospitals with the University of California in 1965, resulted in the expansion of the number of participating hospitals and the merging of six major medical centers and their television facilities to form the Medical Television Network (MTN) for the production and distribution of televized programs. At the end of the second year of broadcasting, Brayton et al (29) reported 72 hospitals participating in MTN with an additional 18 hospitals participating in a video tape distribution system whereby hospitals received the programs on one inch videotape which could then be played on relatively inexpensive video recorders. Through a contract with the United States Public Health Service, the MTN is currently operating with a professional staff and facilities, consequently, the quality of the programs has been greatly improved and the tuition charged hospitals has been lowered substantially. Attendance data shows that MTN broadcasts are reaching some 750 physician viewers each week and that approximately 28,000 hours of instruction are provided in the 38 programs offered yearly. Since most of the programs have generalists as their target audience, it is not surprising that the greatest number of viewers have been general practitioners and

internists, with specialists in the narrower specialties being the least motivated to participate. In 1968, Brayton et al (30) reported that:

> the MTN videotape reduplication and distribution system has been re-organized to combine the Southern California television resources with those of a similar encoded network in San Francisco for Northern California...The resulting videotape distribution system, now called the California Medical Television Network will reduplicate and pool the outstanding programs broadcast for medical and paramedical education in each area and regularly distribute these to participating hospitals...In this way, the combined medical faculties in the most populous state will form the academic base for continuing medical and paramedical education using the newest television modality.

Despite such optimism regarding the future of encoded broadcast television, in a recent report of an evaluation of four programs sponsored by the Northern California Network, Mock et al (165) concluded:

> While most of the assessment techniques in this study encountered serious sample depletion, given this limitation... virtually no measurable changes in either behavior or information level were found which could be directly attributed to the programs...It was noted that two hospitals changed their infection control procedures, but does this make the series worthwhile? The answer to this question would require an objective comparison between postgraduate medical television and other teaching media. The studies which will provide an answer to this question remain to be done.

More pointedly, Lauler (55) concludes: "The exploitation of a given medium without leveraging its advantages in juxtaposition to other media doomed the television medium to failure...The major limitation of the production of television or movie material resides in the software aspect."

Slow Scan Television:

An experimental project currently planned at the University of

Wisconsin will use slow scan television carried by a telephone and radio link from the classroom at the Medical Communications Center to four small community hospitals with reception facilities. As described by Meyer et al (156):

> Using this medium still snapshots are transmitted over ordinary telephone wires thus obviating the need for expensive co-axial or microwave relay systems. Special receivers store the pictures and release them approximately eight minutes later...Thus the participants in the community hospitals have the live voices, the slides, and other visuals used during the conference as well as the still pictures.
>
> Other attributes which make slow scan television attractive are:
>
> Its ability for random access information retrieval so that 5,000 hours of instruction and 10,000 visuals can be stored, retrieved, and shown in remote points. In addition, it holds the ability for hard copy printout at remote locations so that printed information inserted at one end of the system can be faithfully reproduced at the other without teletypewriters, a sort of long distance Xerox Machine.

SUPPORTING DEVICES

The supporting devices reviewed here are those educational technologies which have found their greatest use as quick information sources, or as a means of self instruction.

Motion Pictures; Videotapes:

Probably the most significant development in the area of films has been the establishment of a Single Concept Film Service offered by the University of Wisconsin. Community hospitals are provided with a small portable projector along with single concept films on new medical

techniques which are on loan for six weeks. Each film runs from six to ten minutes and contains only essential information. When the user presses a lever the picture and sound start immediately. Since the film is self re-winding, he can view the film a second time merely by pressing the lever again. Meyer et al, (155) report that a series of six films are in circulation among 47 hospitals in Wisconsin. A recent survey based on approximately 1,600 questionnaire responses from practicing physicians revealed that 93 percent of the respondents felt that the films provided useful medical information.

According to Wenrich (263) pharmaceutical companies have also produced a number of films and TV kinescopes which are loaned to hospital and medical groups. The Upjohn Company has produced a series called Grand Rounds on 16mm film which is available through its regional offices. Similarly, the Roche Medical Laboratory produces videotapes for its "network for continuing medical education" which includes hospitals across the country.

Audio-Tape Recordings and Disc Services:

Probably the oldest and most established tape recording subscription service in operation is Audio Digest, a non-profit subsidiary of the California Medical Association. Oakley (175) reports that some 30,000 tapes are sent each month to subscribers in the United States, Canada, and overseas. These tapes, ranging from one half to one hour in length, represent edited portions of lectures, panels, discussions, and symposia published in current literature. The areas of medicine covered by this service include general practice, internal medicine,

surgery, obstetrics and gynecology, pediatrics, anesthesiology, and ophthalmology. Important meetings are also taped and sent to subscribers. Wenrich (263) reports that Excerpta Medica has begun producing "Voices of Medicine" which provides weekly tape recordings of abstracted literature and feature presentations on selected subjects. The American College of Cardiology, in collaboration with the Radio Corporation of America, has begun a monthly tape service called Access Library Service focussing on subjects which have the greatest relevance to the practice of cardiology (146).

While the aim of these services is to provide a way that busy practitioners can acquire information by listening in their homes or while driving to work, reports suggest that only a certain proportion of physicians are attracted to this process (4, 37, 263). A study reported by Aitken (4) found that of the 655 tapes requested and sent out in 1961, 29 users who took ten or more tapes each year used 513 of the total. Another finding of interest was that 60 percent of the tapes requested went to general practitioners in the country or small towns. In 1962, the Canadian College set up a disc service using twelve-inch long-playing discs in which the members of the service retained their own recordings. This proved extremely popular, and by 1963 a number of listening groups had formed.

According to Harris (111), Smith and Holst Incorporated in California have developed a series of illustrated medical lectures using both film strips and tape recordings produced by Loma Linda University School of Medicine. These lectures range from anesthesiology, internal

medicine, obstetrics, cancer, and cariovascular disease to urology.

Abrahamson and his colleagues (3) at the University of Southern California report a recent evaluation of a special self-instructional device combining a seven inch record with a film strip. In this study, 100 general practitioners selected by stratified random sampling in the 11 Western states served as tne experimental group while another 100 served as controls. Fifteen programs were circulated to the physicians participating in the study. Assessment procedures included: 1) post tests of information; 2) pre-and-post project questionnaires assessing "communication behavior" and program acceptability, and 3) interviews of a sample of the physicians to validate questionnaire responses and to augment the data. Analysis of the data revealed a significant acquisition of information on all programs; high acceptability of the approach, but no significant change in "communication behavior" (defined in this study as "the way in which physicians attempt to obtain continuing education").

In keeping with his basic philosophy that learning should be both fun and challenging, Woolsey (277) is developing a medical jukebox which will offer physicians 160 six-minute 33 1/3 rmp records, totaling 16 hours of instruction. To illustrate the spoken word, two dial-access Carousel projectors have been integrated into the jukebox mechanism so that two by two inch color transparencies are automatically synchronized and projected. If the doctor has a question which the jukebox can not answer, a tape recorder will record the question with the physician's name and address, and it will then be answered by return mail. Another

interesting feature will be that the user will be asked to evaluate the material presented at the conclusion of each record, rating it---very helpful; helpful; slightly helpful; or no help, by punching an appropriate button on the machine. Also being considered is the inclusion of an option that would require the physician to drop a quarter in the slot in order to get his program. At its conclusion, he would be asked a relevant question and offered four multiple choice answers. By pushing the appropriate button he would indicate his choice and if his answer is correct, his quarter is returned.

Mediphone Services:

In 1966, the University of Wisconsin pioneered a non-computerized Dial Access service. The objectives of this project were: 1) to make available current authoritative information twenty four hours a day for use in emergency situations, and 2) as a method of updating medical information. Intended strickly as a quick source of reference each tape is five to six minutes in length. When the physician wishes information relevant to any of the 230 subjects listed in the directory, he merely dials the toll free number designated, and requests the tape. In an average of twenty seconds after receipt of the call the tape is played for him over the telephone line. A preliminary survey in 1968 revealed that: 1) such a library had equal appeal to general practitioner and specialist in both urban and rural areas; 2) a significant number of physicians used the service as long as promotion was reinforced frequently, while a small number of practitioners used the library as an established source of information retrieval; and 3) a significant per-

cent of library ulilization was for continuing education, that is, review, or updating knowledge or gaining new medical information. On the basis of these findings, Meyer et al, (157) conclude: "Whether on the basis of popularity or evaluation data it appears that there is a sufficient degree of enthusiasm for this means of information retrieval and that the dial access library concept can be expected to experience rapid growth." Minnesota and North Dakota are linked to the Wisconsin Library using their own separate communication systems.

In Canada, the University of Saskatchewan has recently initiated a Dial Access Service. To date, "Three hundred and six five-minute messages have been received from Wisconsin and booklets listing titles have been distributed to all Saskatchewan physicians. Twenty new scripts for messages have been completed by Saskatchewan specialists and twenty more are in preparation." Utilization of the service is reported satisfactory to date (13).

The Missouri RMP has sponsored the development of a Dial Access Library which differs from the Wisconsin Library in that the system is computerized. According to Fortney (101), "this makes the service chepaer and more efficient, eliminating the factor of human error." A number of medical specialists are helping to test the system by evaluating the messages from the experts' viewpoint and advising where corrections are required. Under the Alabama RMP the University of Alabama has recently become the headquarters for a "wide area telephone system" providing live telephone consultation services for physicians in widely

scattered rural and semi-rural communities and their hospitals. Called MIST, this project is reported to have served over 900 consultations requests from all parts of the state in a six month period. Brown and Uhl (32) report that both community physicians and faculty have found the system both feasible and useful.

Correspondence; Programmed Instruction:

In 1962 the journal Spectrum published an article on programmed learning along with a programmed sequence on how to read an electrocardiogram on myocardial infarction. The issue was circulated to 225,000 physicians in the United States, of whom 50,000 replied with a "blanket endorsement of the program." As a result, a longer program on allergy and hypersensitivity was made available to physicians on request. Balson (18) reports that this program is in use in 81.3% of the American medical schools.

In 1964, Spiegel (234) reported a subjective evaluation of a course on Diabetes Control taught by programmed instruction on a teaching machine. Of the 78 physicians who completed the course, all felt it was a meaningful program. In comparing this device with other educational techniques, the physicians strongly endorsed the teaching machine approach. On the basis of post program interviews and follow-up mail questionnaires, it was estimated that two thirds to three quarters of the physicians who completed the program have modified, or will modify, their diagnostic and/or treatment practices with diabetes as a result of having participated in the course. Programmed instruction

like correspondence studies, appears to have found its greatest use as a supplementary device used in conjunction with other forms of instruction (54, 59, 61).

Computer Assisted Instruction:

Computer assisted instruction (CAI) in medical education is still in its infancy. Paxton (180) reports that a number of diversified medical cases have been computer programmed by the University of Illinois. A physician with an interesting case can question the computer in his own words and the imaginative programming enables the computer to pick out key words in the doctor's statement for which it then provides the the appropriate answer. Also under development are several computerized self-testing programs. Although these are still experimental, it is planned that they will be expanded to include continuing education hook-ups with some outlying hospitals.

Ohio State University has some tutorial evaluation programs routinely available to medical students and by telephone lines to physicians in ten area hospitals. The equipment is less elaborate in that it uses teletypewriter terminals instead of TV display screens. The teleprinter is augmented by a slide projector with coloured slides and the computer instructs the user when to view a particular slide. The learner takes as long as he likes to examine it then types the response called for by the program.

The University of Oklahoma tested a variety of computerized teaching programs between 1965 and 1968. Harless et al (110) report

the findings of one study involving fourteen practising physicians who attended a one week course in clinical anesthesiology in which a one hour CAI lesson was included. Data showed that the physicians' attitudes toward CAI, educational television, and programmed instruction texts were comparable before exposure to CAI. After the CAI lesson, attitudes toward CAI were significantly more positive than were attitudes towards either educational television or programmed instruction.

At the University of Southern California, Abrahamson et al (3) have produced a computerized learning aid called Sim One which is a realistic mannequin upon which physicians may learn how to carry out endotracheal intubation. The computer is programmed so that the mannequin reacts physiologically to various drugs or treatments which may be administered. Continuous graphic displays show the changes in blood pressure, pulse rate, etc., thereby depicting the mannequin's responses to treatment. Wires run from strategically placed magnets and sensors in Sim One through a large cable to the computer and to the instructor at a control console through which the instructor is kept posted on the physician's progress in learning. In one study of skill acquisition, the learning rate of ten new anesthesiology residents was compared. Five of these experienced conventional instruction and five learned the technique using the mannequin. Findings revealed that those who used Sim One took an average of 30 attempts over a period of 45.6 days to achieve nine out of ten professionally competent intubations as compared with 60 attempts in 77 days for the control group. There are plans to develop refinements of Sim One for teaching other specific techniques to

medical and paramedical workers. Paxton (180) indicates that the Sims "can shorten the time required to teach manual procedures in almost every phase of medicine."

Allen and Ottem (5) report three experimental programs utilizing audio response computer services. One is a drug compatability program in which the input is a pair of drug codes and the output one of four compatabilities: "yes", "no", "conditional", or "unknown." The second program is a burn formula program which calculates the proper initial quantities of electrolytes and fluid required in treatment. The third is a symptom diagnosis program that is augmented by diagnostic data in the literature.

A similar but more sophisticated computer program is reported in operation at the University of Missouri. This program, called Consider uses cathode ray tube (T.V.) input-output terminals. The major weakness is the absence of printed output which could be required for legal reasons or for a patient's record.

The cost of these programs is reported as reasonable. Allen and Ottem (5) estimate that:

> The intravenous additive program costs under 35 cents for each run plus $10 per month for program and data storage. The burn formula program which is purely computational, costs roughly 50 cents per use plus $1 per month for required storage. The diagnostic assistance program costs about 40 cents per calculation plus $2 per month for storage.

They suggest a feature which would greatly improve computer programs:

> Access to data bases from various authorities for controversial subject areas. This feature would give a computer network some

of the flexibility now offered to the physician by having several medical textbooks, journal articles, and scientific documents available on particular topics.

ORGANIZATION FOR INSTRUCTIONAL TECHNOLOGY

A number of recent articles provide evidence of attempts to create proper facilities and environments for the effective use of mass media in continuing medical education. Also being discussed and implemented are centralized systems to expedite the development and distribution of instructional materials and devices on both regional and national levels.

Regional:

In 1959 the University of Utah developed an Audio-Visual Kit which could be shipped to physicians in rural communities. Contained in the kit were medical discussions on long play records, accompanying scripts, and coloured slides. This mail service proved successful so other organizations developed similar programs (232). The University of British Columbia is developing a Mobile Van Service (164) to provide a multi-media approach to continuing education for physicians and members of the allied health professions in British Columbia, particularly those who find it difficult to leave their practices.

The Alaska/Washington RMP is developing a unit which will produce and co-ordinate all educational materials for projects in the two state region. It is anticipated that greater efficiency will be achieved and considerable money saved by centralized production. More particularly, however, the main emphasis of this unit will be to "provide up to date information to the more isolated rural physician by way of

modern communications technology (138).

Cooper (63) reports the establishment of an Office of Audio-Visual Education in the Health Sciences Center at the University of Colorado. With the University's multi-disciplinary student laboratories (unit teaching laboratories), and the newly constructed Office of Research in Health Science Education, it will serve as a central source for production, distribution, and evaluation of multimedia programs for the Colorado/Wyoming RMP. Among the many educational approaches which have been explored, two proposed pilot projects are of particular interest. The first is a videotape exchange program among hospitals within the Colorado/Wyoming region whereby videotape recordings made by the clinical staff of hospitals will be exchanged on a weekly basis. The second will be the production of a series of single-concept films and filmstrips on oral cancer, the audio portions of which will be capable of alteration in such a way that the same films and filmstrips will serve dental hygenists, nurses, physicians, dentists, or patients.

The University of Saskatchewan (13) has decided that its major focus for the next several years will be on the development and promotion of improved "Information Retrieval" methods, and a four stage program has been outlined: 1) to assist community hospitals in their efforts to provide improved library facilities; 2) to encourage and assist physicians in the improvement and expansion of direct telephone consultations, 3) to establish Dial Access Telephone Library facilities; and 4) to assist base libraries in their efforts to provide rapid and efficient subject and bibliographic retrieval by both manual and automated means. Efforts to develop each phase are proceeding simultaneously.

In the Albany RMP, community hospitals are being developed as prototype learning centers for the use of newer instructional technology. These are being set up in three sizes: the smallest are for hospitals with staffs of up to twenty doctors and feature sound tapes, telephone dial access programs, radio receivers which will allow two-way radio conferences, and other related visual materials. The medium sized centers for hospitals of from twenty to fifty physicians will include in addition the medical jukebox. The largest hospitals will have videotape projectors as well. These learning centers are being established either as an integral part of the medical library or are located adjacent to a library and are under the continuous supervision of library personnel. According to Woolsey (277),

> Medical libraries can no longer exist just for the storing and retrieval of printed information. To be really useful, a medical librarian should be on hand as an instant consultant. If what you need is not immediately available, the librarian should dig it out quickly or the impulse to learn may be lost.

Similarly, Castle (41) reports that the Inter-mountain RMP staff have helped to organize the following learning resources in the major community hospitals:

Conference Room Equipped With:	Established
Usual teaching aids	18
Audio playback	10
Television playback facilities	4
Two-Way Radio Connection with the University Medical Center	32
Medical Library and Exchange System with University Resources	
Audited Medical Records System, Integrated with Educational Programs (PAS MAP)	9
Medical Education Co-ordination, or Core Faculty	5

National:

As the various medical centers became increasingly involved in producing programs for television, the need for a centralized agency to co-ordinate programs and film exchanges has culminated in the establishment of a National Association of Medical Television Broadcasters in 1965 with headquarters in Utah. The objectives of the Association are: 1) to promote the use of broadcast television as a medium for continuing education, and 2) encourage wider co-operation in program planning, production, and distribution. At the moment, videotapes are readily available through the services of this Association (AMTVB) and according to Brayton et al (29), "any medical school or organization having access to an ETV station or link up with such stations can now initiate its own postgraduate medical television broadcast series at minimal cost."

The National Medical Audiovisual Center (NMAC) in Atlanta, Georgia, lends more than 93,000 audiovisual items each year to members of the health professions. The Center is said to have the world's largest medical audiovisual collection. In addition, the NMAC produces all types of audiovisual materials for health professions and serves as an international clearinghouse for biomedical audiovisual information (172).

The Medical Literature Analysis and Retrieval System (MEDLARS) is a computerized bibliographic system developed by the National Library of Medicine. In use since 1964, this system indexes the major medical journals using a computer to store the information. Index Medicus is printed directly from the computer, thus by scanning the subject section

of this listing, a searcher may determine whether his field of interest is adequately covered by MEDLARS. If so, MEDLARS will retrieve the literature relevant to his specific request. Lancaster (136) reports that "over 3,000 demand searches are now formulated annually at the National Library of Medicine. Additional searches are being handled at regional MEDLARS centers in the United States, the United Kingdom, Sweden, and more recently in Canada." Although not without its limitations, MEDLARS offers the most extensive and quickest indexing service presently available on medical literature.

The Interuniversity Communications Council (EDUCOM) was organized in 1965. It represents not only the health professions, but also a variety of university disciplines equally interested in developing and sharing resources in higher education. Although beginning with representatives from eight universities, Miller (162) reported eighty-eight participating universities in 1968. Future plans of this organization include the development of a multimedia electronic network which will facilitate sharing of resources and accelerate information processing. In medicine this will provide rapid access to specialists when their advice is needed. The four criteria followed in developing the network are:

1. That it be interdisciplinary for all fields and not only for the health sciences.

2. That its services be available everywhere in the United States, and eventually, by extension, everywhere in the world.

3. That it be a multimedium network, not limited to computers or facsimile transmission of documents or television or computerized program instruction, but including all media of educational value which can be put on an electronic network.

4. That whenever feasible, all materials be available rapidly on demand, when desired by the user.

CHAPTER VI

EVALUATION

Since the primary objective of continuing education in medicine is the achievement of learning that will result in improved patient care, it is necessary to evaluate program activities. As Abrahamson (2) has stated, evaluation is a "continuous process based upon criteria co-operatively developed, and is concerned with the status of, and changes in behavior of the learners." In theses terms, evaluation has not been an integral part of continuing education in medicine although it is now becoming a matter of concern. There has been an increase in the number of evaluation studies found in the literature over the past few years but most of these suffer from inadequate design and measurement so that the results achieved are largely inconclusive. Such evaluation as has been reported is principally subjective but there is a promising increase in attempts at the objective assessment of learning.

SUBJECTIVE ASSESSMENT

Next to attendance records, the most commonly reported form of evaluation is the follow up questionnaire which solicits participant opinion with regard to a program (2, 220, 241). The information usually sought includes why physicians attended, their impressions and opinions with respect to various aspects of the program, and whether they felt they achieved their objectives. Since these instruments solicit unver-

ified subjective opinions about an educational event they are often referred to as a "hapiness index" or opinionnaire. While such instruments may be useful in planning future courses, they provide no evidence that learning really occurred. Donnelly and Natfulin (77) report an experiment which illustrates this point:

> We recently conducted a somewhat limited study of the validity of the so-called happiness index. An actor was hired and programmed to speak incoherently on a topic of interest to medical educators...His name, erroneous titles, and degrees were included on the program seminar. He gave a highly technical presentation which consisted of nothing more than mere double talk. He spoke on a subject about which he knew nothing. An analysis of the substance of his presentation indicated that it consisted primarily of unrelated examples and a few good jokes. Following this very "entertaining" lecture, the audience (consisting primarily of instructors...) was administered a replica of one of the hapiness questionnaires...Without exception the group rated the lecture and ensuing question and answer period highly in every respect. They found it interesting, informative, and stimulating...

In other words, the medical educators in attendance were very happy with the instructional experience despite the fact that the programmers had minimized the learning component. While this is obviously an extreme example, most writers agree that it is not sufficient to consider a program successful simply "because attendance is high and complaints are low" (27). More recently, various modifications of the happiness index have been reported. Levinson (140) evaluates his one-week health seminars by having participants rate each lecture and all other aspects of the seminar on a five-point scale. They are also asked to comment freely about the experience and to add additional comments to the evaluation sheet at the end of the week. Six months later, through a mail questionnaire, each participant is again asked to evaluate the

experience. This time he is asked what he thinks he learned at the seminar that was most useful to him, what was least useful, how he applied what he learned, and what problems he had in their application. Although Levinson is not entirely satisfied with this procedure of evaluation, he reports constructive feedback and specific examples of changes in medical practice which physicians have attributed to course attendance.

From the field of public health, Parlette (179) reports experimental studies using paired questionnaires, one answered by the participant concerning change in himself as he perceives it, and the other, by his superior. The hypothesis is, "that the deeper the individual insights are, the more likely change will occur and be recognized by his superiors and therefore the participant's reported change is more valid."

Another variation of the opinionnaire is the use of a personal interview with small randomly selected groups of participants prior to and following each session of the program. Meyer is quoted by Vaneslow (254) as saying that "this technique is exceedingly useful in eliciting pertinent and candid comments from participants."

Dohner et al, (75) devised an instrument which can be used as an index of the effectiveness of short courses. This is a motivation scale, consisting of a set of bi-polar adjectives designed to assess the degree of enthusiasm or motivation as judged by the learners' perceptions of the general value and relevance of course objectives and content in meeting their learning needs. Evidence of the reliability of the instrument was provided by correlating each scored item on the scale with

participants' questionnaire responses. Although the results from one preliminary study indicate that the scale with further refinement could provide a valid instrument, the extent to which the scale predicts changes that actually occur in a participant's subsequent behavior has yet to be validated.

Although the "happiness index" or opinionnaire has no validity or reliability it is exceedingly popular with program directors even though it is of no real value as a judgement on a program. It would be advantageous if all of those in continuing medical education could work together to develop some standard objective instruments to assess opinions about their programs. This could be done with less trouble and expense than is now wasted individually on invalid subjective measures.

OBJECTIVE EVALUATION

The use of objective measures for evaluation is increasing. Such measures can provide hard data to assess whether programs are achieving their objectives and enable program planners to work with greater security that the evaluation has some validity. Objective instruments have been constructed to measure specific content material acquired, attitude development or change, feelings about instructional activities, job performance, and patient care.

Testing for the Achievement of Learning:

The pre- and post- design using paper and pencil tests has become fairly common in continuing medical education. A number of writers con-

sider that the practice is reasonably well accepted by physicians (244) (271). Since most of these tests are teacher-made and based on specific information the practitioners are expected to learn, the results in no way identify what the physicians actually do learn. Furthermore, studies have found that neither knowledge gain nor satisfaction necessarily ensure desirable changes in behavior.

An evaluation of an intensive psychiatric and neurology review course reported by Natfulin and Ware (170) is interesting in this regard. In this study, the experimental population consisted of twenty-two psychiatrists enrolled in a program. Twelve of the group were studying for specialty board examinations while another ten constituted a control group who were studying for certification through traditional self-study methods. The four evaluation techniques used were: 1) simulated American Board examinations; 2) multiple choice examinations; 3) interviews; and 4) satisfaction questionnaires. As hypothesized, those in the course passed the board examinations at a proportionately higher rate than did the controls, and expressed a higher level of satisfaction with their board preparation. There was no significant change in the mean scores for those board examiners and experts who also took the tests. On the basis of these findings, these researchers conclude:

> While the debate over peer review, mandatory continuing education, re-certification, and serial certification programs become hotter, medical education must develop more effective evaluation of the relationships among continuing education, specialty skills, and clinical competence. If continuing education interests correlate with clinical needs in both geographic and specialty areas of medical practice, more agreement may be reached as to what clinical competence is...

In this respect, Miller (161) identified the critical components of clinical competence pertaining to orthopedics through an analysis of over 1,700 critical incidents contributed by practising orthopedists. Since these competencies are relevant to most areas of medicine, and with additional refinement could be used as the basis for defining measurable behavioral objectives in most fields of practice, they are re-stated here:

1. Skill in gathering clinical information:
   a. Eliciting historical information
   b. Obtaining information by physical examination

2. Effectiveness in using special diagnostic methods:
   a. Obtaining and interpreting x-ray films
   b. Obtaining additional information by other means

3. Competence in developing a diagnosis:
   a. Approaching diagnosis objectively
   b. Recognizing conditions

4. Judgement in deciding on appropriate care:
   a. Adapting treatment to individual cases
   b. Determining extent and immediacy of therapeutic needs

5. Judgement and skill in implementing treatment:
   a. Planning the operation
   b. Making necessary preparations for operation
   c. Modifying operative plans according to situation

6. Effectiveness in treating emergency patients:
   a. Handling patients
   b. Performing emergency treatment

7. Competence in providing continuing care:
   a. Attention postoperatively
   b. Monitoring patient's progress

8. Effectiveness of physician-patient relationships:
   a. Showing concern and consideration
   b. Relieving anxiety of patient and family

9. Accepting responsibility for the welfare of the patient:
   a. Recognizing professional capabilities and limitations
   b. Relating effectively to other medical persons

Using this scheme, Miller and his colleagues then undertook a systematic review of both the oral and written parts of certifying examinations for the American Board of Orthopedic Surgeons. This study revealed that tests in both subject matter and professional skills were incomplete and spotty. Accordingly, a new certification program was developed using these defined competencies as the basis for test construction.

The study by McGuire and colleagues (149) illustrates another well known problem of educational testing, namely: that loss of skills almost always occurs unless periodic reinforcement is provided to maintain the skill. Using one control and four experimental groups of 30 to 40 physicians, the study sought to determine gain and retention of auscultatory skills in physicians following a twelve to twenty hour intensive course. Prior to instruction, both the control and experimental groups were pre-tested on the identification of fifteen unknown heart sounds. Immediately following the instructional program, the four experimental groups were re-tested. At this time, a review of hospital charts was undertaken for the control group and one experimental group to assess the information recorded on patients hospitalized with cardio-vascular problems. On the test administered immediately following the course, the experimental groups showed statistically significant gains compared to the control group. At six months, however, the mean scores were not significantly different from the mean score of the pre-test. Moreover, chart reviews of both the controls and experimental groups showed no significant difference in the recording of cardiac findings.

Richardson (201), using a study similar in design to that of the McGuire group, was able to demonstrate some auscultatory skill retention with two groups of physicians (N=16 and 15), and with a third group, (N=15), a mean gain of from 6.4 to 12 six months after training. He attributes these differential findings to the intermittent training schedule used in his study as compared with the intensive one session course provided in the McGuire study.

A number of exploratory studies using the pre and post test design to measure attitude change are reported from the field of psychiatry. Zabarenko (281) concluded that "the results are tantalizingly suggestive but far from coherent." Tucker et al (249) in a longitudinal study of 219 volunteer flight surgeons used scaled questionnaires to measure attitude change following a six month postgraduate course consisting of 48 lectures and eight three-hour interviewing sessions. The questionnaires, administered at the beginning and at the completion of the course, and again eighteen months later, were designed to elicit responses to some 44 frequently heard statements about psychiatry which were scored on a four point scale. The criteria used to score the responses were established by four independent psychiatrists. The most significant findings were that "while the physicians' attitudes toward psychiatrists, psychotherapy and mental illness changed very little over time, they felt more confident and competent in treating psychiatric patients." These findings represent a sampling of opinions and attitudes of a group of student flight surgeons with regards to certain statements about psychiatry, and in no way provide conclusive evidence that any behavioral change occurred which was attributable to course attendance.

Pearson (181) used four specially devised scales to evaluate eight short term psychiatric seminars for general practitioners in eight different communities. Sponsored by WICHE, the programs were all similar in format and used mainly a non-directive approach. The scales used were designed to measure: 1) role tolerance, 2) psychiatric orientation, 3) apostolic function, and 4) social distance. The criteria used to score the scale were the scores achieved by the psychiatrist instructors. The scales were administered as pre- and post-tests to a total of 79 physicians. Although the finding were somewhat varied on the individual scales, statistically significant relationships were found between one or more scales and, on the basis of this, these researchers conclude that the course achieved "attitude change in the desired direction."

On the other hand, Chassy and Heslin (181), using a similar research design, were unable to confirm attitude change in their study of 79 general practitioners who had attended another ten WICHE seminars. Commenting on these studies, Smith (181) states:

> To decide seminar goals is a difficult enough matter but to decide in an objective fashion whether the goals have been achieved is in my judgement, considerably more difficult. Perhaps the most satisfactory means of evaluation is via objective measuring instruments. However laudable the evaluation efforts of my WICHE colleagues have been in this direction, they are the first to admit that their attempts have a strong element of superficiality in them. Can a questionnaire ever be devised to indicate that a physician is more psychologically minded, has more human understanding, and has the therapeutic ability to help his patient toward further understanding of himself? I feel that these are extremely difficult things to measure and to assess.

Forman and his co-workers (100) attempted to test attitude change following short term psychiatric seminars utilizing tape recorded simulated patient interviews. As a pre-test the physicians (six in one test situation and 17 in the other) were required to answer questions related to these interviews. This procedure was repeated at the end of the course and the results of the two tests were compared. The same recordings and questionnaires were also presented to the criterion group consisting of psychiatric resident and staff physicians. Although it was felt that a fair degree of change occurred in the understanding of and interest in psychiatry, the results were inconclusive as measured against the criterion group.

Enelow and Adler (89) have defined goals more clearly, and in spite of a limited sample, they report more conclusive results. In one study (90) designed to measure the effectiveness of a series of ten psychiatric case conferences in producing cognitive learning gain, a before and after design was used that employed instructed responses to three films of simulated interviews. The responses of the psychiatrist instructors provided the criteria against which the fourteen participating physicians were rated. Of the three major hypotheses testing attainment of the stated objectives, two were substantiated at better than an .05 level of significance.

Another study reported by Enelow and Adler (87) concerned attitude change following an advanced supervisory psychotherapy course consisting of 32 four hour session. Four Guttman scales were used to measure the four dimensions of the physician's role in the doctor-patient

relationship (authority; self-involvement; expression of concern; and instrumental). These were administered to six physicians before and at the end of the course. A comparison of the two sets of scores revealed that during the course the physicians' conception of the doctor-patient relationship became more consistent in support, moderate in reliance on technical procedures, and high in self-involvement. A follow up interview undertaken several years later revealed that all six physicians had changed their style of interviewing patients, with more emphasis on the patient's behavior and less dependency on psychotropic drugs and psychiatric referrals. Enelow and Myers (91) note that "change in attitude and practice will occur for physicians who take two or three years of psychiatric courses culminating in the advanced supervised psychotherapy course."

Measuring Change in Performance:

Belkin et al (21) attempted to assess the effects of a short training program designed to assist the staff of the Child Health Station in New York City to integrate mental health principles into their daily practice. Using a before and after experimental design, 48 participating physicians were randomly assigned to an experimental and to a control group. The experimental group was observed and scored in detail by two different observers prior to the course and again one month after completing training. The control group, which had not gone through the program, was similarly observed. In order to validate the instrument, observers were not told whether the doctor being observed was in the experimental or control group, and the doctors were not told

why the observers were present. The series of observations of performance and questionnaire responses indicated that while the training program was relatively successful in instilling a knowledge of mental health principles and techniques of counselling, a comparison of experimental and control groups suggested that the program was less successful in altering physicians' behavior in practice.

Roney and Roark (212) used patient records as the primary source of data to evaluate the effectiveness of a circuit course. The sample consisted of 1,092 patient records of 41 practising physicians, 24 of whom had attended one or more sessions of the course. The physicians were asked to respond to statementsconcerning 12 health problems that reflected the content of the course being studied. They also selected procedures pertinent to the management of these health problems from their medical records. The use of these procedures as indicated by the patient records was then compared for participants and non-participants both before and after the course. Both groups gave correct responses to the questionnaire and although the findings suggested that physicians attending the course were somewhat more competent in the management of selected health problems indicated by patient records, the difference between the two groups was not statistically significant.

Foster and Lass (102) also used patient records as a source of data to evaluate a videotaped program on the use of diuretics. Two matched hospitals were used, one serving as the experimental and the other as the control group. Observations were made of patient records in both hospitals for three weeks prior to and three weeks following

the showing of the videotape in the experimental hospital. The information sought was the extent to which there would be an increase in serum potassium and sodium determinations in the experimental hospital as a result of the videotaped program. The analysis of patient records found no significant differences. The data did reveal that physicians in the experimental hospital were functioning at a significantly higher level than the control group prior to the program. Accordingly, as noted by Abrahamson (1), "One can say that the objectives for using that program were inappropriate...inappropriate certainly for the practice needs of those physicians."

Measuring Long Term Results of Care:

While the ultimate goal of all continuing medical education is the improvement of medical care, efforts to establish cause-effect relationships have proven both difficult and disappointing. One early attempt was a study by Peterson and others (185) of 94 general practitioners. They observed and rated the quality of medical care being practised and then assessed the qualitative rankings against the number of hours of continuing education per physician per year. Some of the superior physicians in this study were found to have taken little continuing education while some of the poorest were frequent participants. This suggests that there was little relationship between the quality of care and participation in continuing medical education.

A more recent study (141) disclosed similar findings. Utilizing an epidemiological approach, this statewide survey attempted to relate physician participation in continuing medical education to 1) reduced

maternal and perinatal deaths, and 2) physicians' use of certain surgical procedures. Findings revealed that no such relationship existed. In fact, maternal death rates were highest in two regions with the highest physician participation in obstetrical programs of continuing education and lowest in the regions where physicians took the fewest hours of study. Moreover, in the two regions with the highest tonsillectomy rates, physicians attended no postgraduate course on otolaryngology during the ten year period under study.

In a two year study Korchin (133) sought to determine whether an extensive physician education program would appreciably alter attitudes and improve practice in relation to the medical management and control of rheumatic fever. In this project, 100 physicians in one county served as the experimental group and were offered a variety of educational offerings during the course of one year, while 50 physicians in a second county served as the control group and were offered no extra learning opportunities. Data pertinent to physicians' medical knowledge and practice with regards to rheumatic fever was obtained by the use of before and after interviews in the two counties and the differential responses scored and compared.

Without belaboring the obvious limitations of the research design, two findings of this study are worth reporting: 1) those physicians who were already practising medicine at a high level were more favorably inclined toward the educational programs and to public health measures in general, and 2) in both counties, physicians' medical knowledge regarding the diagnosis and control of rheumatic fever was high,

but their use of laboratory methods to confirm diagnosis and their use of prophylactic drugs was inadequate. In short, the application of what the physician already knew seemed indicated. Others reporting similar findings were Tabennaus (244), Peterson et al (185), and Clute (46). Indeed, in Clute's study, a higher percentage of physicians who said it "was not particularly difficult to keep up in medicine, were practising a low calibre of medical care." Commenting on this finding, Lewis and Hussanein (141) ask: "How can physicians judge their need for continuing education, if they are not even aware of their own limitations as practitioners?"

Program Models for Built In Evaluation:

Varying from these approaches have been several recent attempts to help physicians identify their own deficiencies based on patient care research, and then to evaluate the effect of educational efforts designed to help overcome these deficiencies. The first study using this approach was that reported by Williamson and his group (272). The purpose of this pilot project was to:

> 1) Measure physicians' responses to abnormal and unexpected results of three routine admission tests (evaluation); 2) determine whether the physicians needed to improve their responses (objectives); 3) provide the required education (instruction); and 4) re-assess responses to these screening tests and evaluating and repeating the cycle as many times as required to achieve and measure the desired level of proficiency.

Initial assessment was accomplished by means of a chart review and since it revealed that approximately two-thirds of the unexpected abnormal test results went unheeded, a workshop was held to discuss

the findings. Although a subjective evaluation of the conference indicated that the physicians found it stimulating and informative, follow up chart reviews disclosed continued neglect of laboratory reports. Accordingly, the educational approach was changed with efforts directed toward altering the physicians' behavior patterns. Removable fluorescent tape was used to obscure abnormal data on the laboratory reports and this resulted in a significant improvement in the physicians' response to test results. This change in behavior was maintained by more than one half of the participants six months after the use of the tape was discontinued.

In the second phase of the project, Williamson's group (271) demonstrated a method for identifying areas requiring priority attention as disclosed by patient care research. The method consisted of three steps: 1) ranking each medical condition encountered at the hospital according to expected patient disabilities; 2) determine which were preventable or treatable in the light of current medical knowledge; and then, 3) assessing the extent to which current medical knowledge was being applied with regards to these conditions. The application of this priority system resulted in the identification of six top ranking health problems which then provided direction for the development of the continuing education program of the medical staff.

Using an elaboration of the Cybernetic model (see Table IV) Brown and his colleagues (32) at Chestnut Hill community hospital have conducted several pilot projects with good results. In one

study, ten top ranking diseases were identified and the hospital staff involved in developing criteria of performance in the management of these high priority diseases. Using these criteria in conjunction with chart reviews of patient follow up, Brown and his group have been able to demonstrate the value of this approach in arriving at precise objectives whereby educational efforts may be measured in behavioral terms. To illustrate, they report an investigation conducted in the use of Antibiotics:

> From studies of those health problems which the system of priority indicated as offering significant potentialities for improving patient care, it became evident that since in one medical department a review of fifty consecutive records of patients revealed only a thirty percent correct usage of antibiotics, a program was required to correct the educational deficit.

To further determine whether the educational deficit was an informational or problem solving deficiency, an examination based on sixteen of the cases reviewed was taken by 42 members of the department studied. The test results indicated that the physicians had adequate knowledge, so four conferences were held in which the physicians discussed patient management with experts and appropriate literature was introduced as necessary. A follow up study on the performance of physicians, using chart reviews and data from the pharmacy, revealed changes in drug use and management practices consistent with the behavioral change desired.

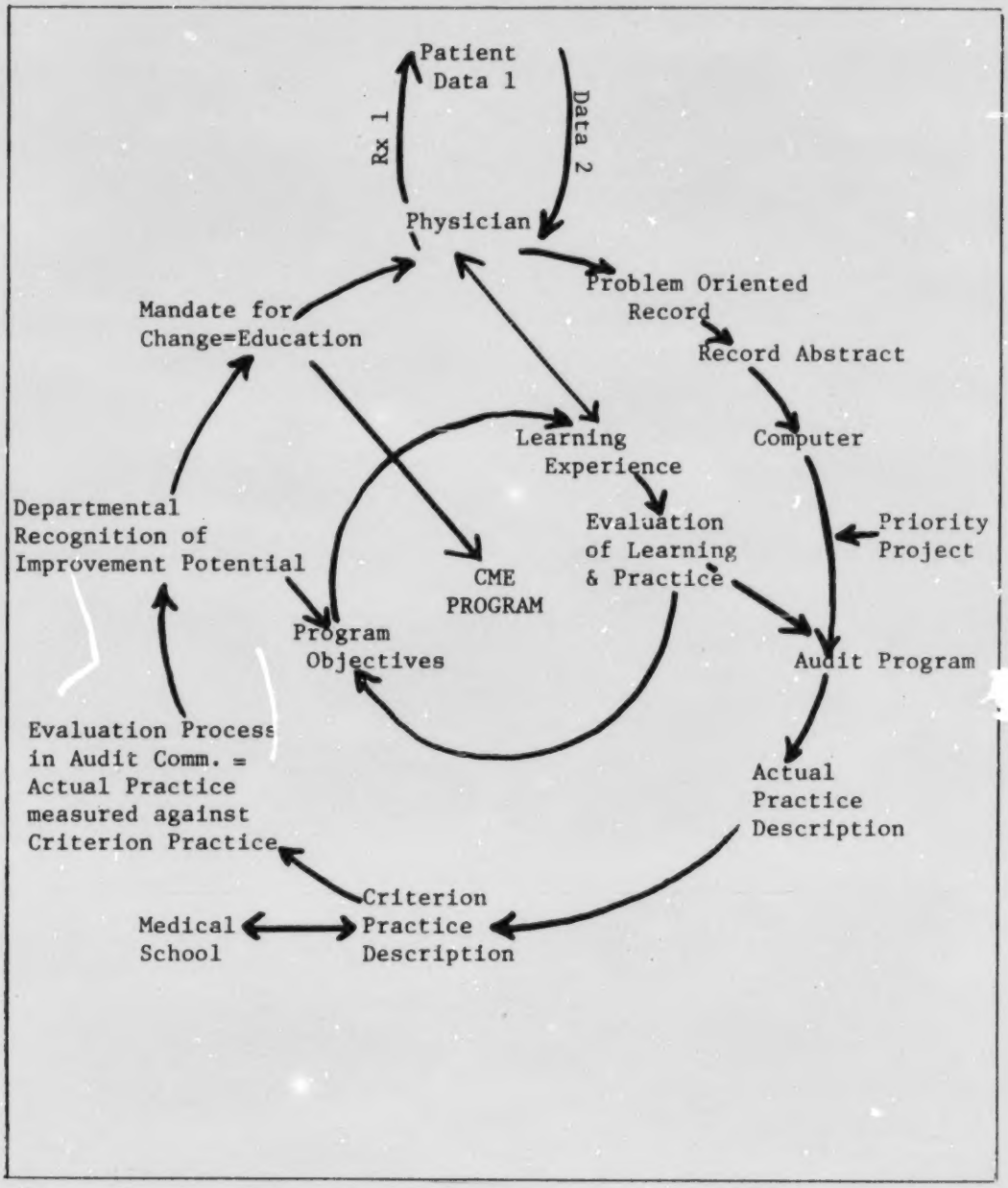
In a modification of this approach, (237) a group of experts from across the nation developed a criterion of performance for the top ranking health problems. A number of Simulated Patient Problems

were then devised based on these priority health problems which enabled a physician to test his own performance so as to identify deficiencies which could serve as the basis for planning and evaluating programs of continuing medical education.

Another program model which attempts to provide individual instruction according to objectively identified deficiencies of practising physicians is the Physicians' Profile Project in operation at the University of Wisconsin. The procedure in this case was to: 1) gather data pertinent to the physician's practice; 2) test the physician in the major areas of his practice; 3) provide educational consultation and study relevant to his practice profile, test the results; and then 4) provide for subsequent re-profiling and testing as a form of program evaluation. In the study reported, a medical secretary visited the offices of 37 volunteer physicians for a one-week period, collecting patient data which was coded to provide each physician with a practice profile. The physicians were then tested through the use of multiple choice examinations based on their profiles. For convenience, tests were administered by way of portable teletype equipment linked to the University of Wisconsin Computer Center. Educational consultants from the medical center then met with each physician to plan a program of study related to the physician's profile and test results. Although this study disclosed that the testing procedures required refinement, and the overall program reduced in costs, the approach was feasible, and the continuation of the project was recommended.

TABLE IV

THE BI-CYCLE: RELATION OF PATIENT-CARE AND EDUCATION CYCLES



SOURCE: Brown, C., and H. Uhl, "Mandatory Continuing Education: Sense or Nonsense?" JAMA; 23:1663 (September, 1970).

PROBLEMS OF EVALUATION

The research reports that have been concerned with the evaluation of programs in continuing medical education suffer from major deficiencies that are slowly gaining recognition. Although virtually everyone concerned with continuing education agrees that evaluation is a good thing, there is no general awareness nor acceptance of the importance of maintaining ordinary scientific controls in conducting evaluations. Too many seem to be content with casual and unsystematic opinionnaires that have neither validity nor reliability in preference to the more difficult and rigorous scientific approach to evaluation that can provide usable data. This reluctance may stem, in part, from the problem of identifying precise instructional objectives and, in part, from the problem of constructing adequate research designs and instruments.

The Problem of Objectives

As noted earlier, there have been numerous surveys attempting to define the general interests and felt learning needs of physicians. More recently, self-assessment tests have become increasingly popular as a way of helping practitioners identify their own learning needs. At the community level, several RMP have conducted consumer surveys in an attempt to identify the health needs of the community (108, 252). While useful, as stated by Miller (160), "These types of efforts in isolation do not necessarily identify the real learning needs." Moreover, equally apparent in most of the studies reported, the the pre-

valence of vaguely defined objectives which are not readily translated into measurable terms, or which are unrealistic in relation to reasonable expectations of achievement.

Too many programs attempt far too much for the time available, so that the objectives are global rather than specific. Vaguely conceptualized objectives provide no criteria against which to measure results; consequently, in order to evaluate continuing medical education the objectives must be stated explicitly in measurable terms and the programs limited to those objectives.

Design Problems:

An obvious weakness of evaluation studies is the inadequacy of the research designs. Most studies suffer from problems of control such as inadequate sample size, temporal change in educational outcomes, problems of measurement, and experimenter-participant constraints, to name but a few.

Although attention has focussed recently on the successful program evaluations reported by Williamson and Brown, using the medical audit, as warned by Vaneslow (254), "One could argue that each succeeded largely because of the personal charisma of the individual in charge, and that it would be dangerous to assume that equal success could be anticipated in other settings." Moreover, since most care is not given in the hospital but in the physician's office, the use of such a method would need to include an audit of the physician's office practice as well (62). Even more importantly, as pointed out in the recent Conference on Evaluation (49),

> We have been discussing the medical tangibles, pneumonia, the capacity to handle the acute coronary, or whatever you will. What about insights into the emotional areas? No just psychiatry but emotion in relation to illness, in relation to life and death...the kind of things that we do not really see even in the records...These are the things that go on between a physician and his patient, or the patient's relatives. Do we not need something in evaluating procedures here?

It is curious to note that the evaluation studies reviewed rarely made note of the research done in other areas that was relevant to the subject. Most of the design problems evident in the evaluation of continuing medical education have been tested elsewhere--particularly in the general field of adult education. Such research makes it unnecessary for continuing education in medicine to re-invent the wheel.

Costs:

Herzog (116) provides the most recent and detailed estimate of the cost factor in the evaluation of continuing medical education. He has analyzed and compared the cost of several approaches to evaluation showing the relative cost of each (Table V).

According to Herzog, "The guiding principle in judging how much should be spent for evaluation is that marginal costs should approach but not exceed marginal value of the information obtained." Even then he admits great difficulty in assessing effectiveness values versus costs but he does suggest that since "...studies on behavioral change or patient health status greatly exceed course costs, they can be justified only as they relate to the objective of contributing to general knowledge."

TABLE V

ESTIMATED COST OF DIFFERENT EVALUATION TECHNIQUES

FOR A HYPOTHETICAL ONE-WEEK SHORT COURSE

Evaluation Technique	Estimated Cost	Fixed Course Cost	Percent of Course Cost
Participant Opinion Analysis	$ 945	42,000	% 2
Pre-Post Examination of Knowledge	2,455	42,000	6
Mail Survey of Performance Change	47,640	42,000	113
Survey and Observation of Behavior Change	155,850	42,000	371
End-Result Studies of Patient Health	212,350	42,000	506

SOURCE: "Costs of Evaluation"; Proceedings: Evaluation in Continuing Medical Education; Kansas City, Kansas, The University of Kansas Medical Center, August 1970, p.28

CHAPTER VII

SUMMARY AND CONCLUSIONS

Professional education in the field of medicine is divided into three distinct phases: 1) Undergraduate education leading to the M.D. degree; 2) graduate education covering the internship, residency, or other full-time study leading to a license, a professional specialty, or to an academic degree; and 3) continuing education which includes those activities in which practising physicians engage to acquire the new knowledge and skill necessary to keep current in their profession. The first two phases have received the major attention of the profession over the years but continuing education is now becoming a matter of central concern. This concern is not necessarily new, for some of the concepts currently considered new have been recognized and documented in the literature over the past half-century. At first, continuing education in medicine was concerned primarily with correcting deficiencies in basic medical education and in this respect, medicine was following the tradition then current in the larger field of adult education. Since 1930, emphasis has shifted from remedial education to the learning necessary to keep up to date in a rapidly expanding professional body of knowledge.

SUMMARY

This review of the literature published from 1960 to 1970 has been concerned chiefly with the development of programs for continuing medical education. The material reviewed has been discussed under four

main headings and is summarized below.

Participation:

Although based on a limited number of available surveys this review of the perceptions of learning needs suggests that there are many reasons, both personal and professional, which determine how much continuing education a physician takes, and where and how he takes it. While there is some indication that specialists and physicians in metropolitan areas attend courses more often, age is the only variable which bears a significant relationship to attendance patterns.

The recurring theme underlying all discussions, is that the physician, and more particularly those in general practice, are busy and their time cannot be wasted. At the same time, a multi-faceted continuing education need exists. While these needs, both general and specific to the practitioner's location and field of practice are identifiable, less evident are those related to the physician's individual practice. Furthermore, there is some indication that a physicians' felt learning needs may not be those most pertinent to his immediate medical practice.

Hence it would seem that those programs which involve practitioners in identifying their "real" educational needs are more likely to succeed than those programs predesigned and presented. Moreover, while physicians most often select the traditional methods and techniques, surveys suggest that familiarity with the different approaches, as well as age, and field of practice, are important variables influ-

encing choice. Thus it is apparent that a wide variety of approaches are indicated, taking into account these variables, and utilizing those methods and techniques to which physicians feel that they can respond.

Organization and Administration:

Most medical schools, professional societies, hospitals, and voluntary agencies, are actively engaged in providing educational programs for practising physicians. The major problem confronting these sponsors is the lack of a sound administrative and academic base capable of adapting programs to the nature and needs of physicians in practice.

The areas of identified needs include: 1) improved methods of determining real learning needs; 2) more clearly defined program objectives, both short and long term; 3) administrative arrangements which would facilitate the planning of interrelated program offerings scheduled to meet the varying needs and preferences of busy practitioners; 4) a more sound fiscal base which would permit more long term continuing education; and 5) the improvement of the quality of instruction provided.

Despite these limitations, there are clearly discernible trends: 1) local and regional conditions more conducive to the establishment of a national plan; 2) greater standardization (minimal standards) of course offerings through the AMA's program of accreditation; 3) a greater concerted effort to motivate physicians to continue their education; and 4) a definite trend toward the decentralization of programs, using the community hospitals as one of the major foci of continuing medical education.

Instructional Processes:

In 1963, Miller (159) wrote,

> This may sound like the repititious beating of an old and very tired horse, but the simple fact seems to be that continuing education today, like continuing education thirty years ago, is obsessed with the notion that exposure to the learned assures learning. Yet each generation rediscovers the fact that in the end it is the learner who must do the learning, and no amount of communication by lectures, by book, by film, by radio, or television, will make the slightest difference unless he does something with what he receives. Both teachers and students have for too long allowed themselves to be deceived by the comfort of instructional methods that require little more than a student's presence, or by the gesture toward active participation embodied in the question period.

In continuing medical education, almost every method, technique, and device known to education is presently in use. Yet, there is little evidence to suggest that any one media or technique contributes to more or better learning. Moreover, close examination suggests that even the most versatile of the newer educational technologies has been used largely in isolation, and mainly to provide physicians access to new medical knowledge.

As it stands at the moment, the field of medicine has made a greater investment than any other in the use of instructional technology. Unfortunately, this experimentation has not been well grounded in adult learning nor has it been studied adequately to determine its precise role in the achievement of learning and the resultant improvement of patient care. Consequently, there is no hard data available to indicate which kinds of instruction under what circumstances and for what kinds of participants best achieve the learning objectives desired.

Evaluation:

Evaluation in continuing medical education has been approached in several ways: by counting attendance; by obtaining participants' reactions; by testing achievement; by measuring changes in medical practice; and by measuring end results of care.

Measurement techniques have been as equally varied. These include: "The use of motion picture film in testing observation; an erasure technique allowing the testing of clinical problem-solving; the application of certain simulation techniques in testing diagnosis; the substitution of non-patient for a real one to facilitate testing of clinical performance" (2); and more recently, the use of the medical audit.

Despite these efforts, this review of studies on evaluation has found a general lack of substantive research and can but repeat the discouraging conclusion of many writers in the field that continuing medical education may not be having a demonstrable effect on medical care.

From experience in the area of general adult education, perhaps Knowles (132) offers the best advice:

> Fundamentally the issue as to how much and what kind of evaluation a given adult educator will engage in will be resolved by referring to his philosophy of education...indeed, his very definition of education. If he defines it as a process of educating a person, of taking responsibility 'for making changes in a human being'...then he does certainly incur an obligation to measure as precisely as possible what he is doing to that person and subject his findings to ethical review. His evaluation will also be greatly concerned with efficiency...with getting data to determine whether or not he is producing maximum change in the shortest possible time at the least cost. His dominant theme will be quantification. But if he defines education as a process of facilitating and providing resources for self-directed inquiry and self-development, he incurs an

obligation to involve the participants in collecting data that will enable them to assess the effectiveness of the programs in helping them accomplish their objectives. His dominant theme is involvement.

CONCLUSIONS

In considering the expansion of continuing education in medicine, one of the more promising recent developments has been the American Medical Association's accreditation program. Although it is still to early to assess its overall effect on the field, ultimately it should help to establish minimum standards, thereby improving the quality of program offerings. Equally important is the growing trend toward making the community hospital the major foci of continuing education.

Extensive experimentation in the use of the mass media also promises to extend continuing education beyond the confines of the university campus and it has helped to focus attention of their potential for self-instruction.

Despite these and other positive features, many negative trends persist. The majority of programs have been designed to assist physicians in keeping up with advances in medical knowledge, even though the research suggests that the application of new knowledge may be less crucial than the utilization of what is already known about good medical practice. It would seem that more sequentially planned, clinically oriented programs are indicated, and faculty equipped to facilitate learning rather than simply to communicate more information.

At the same time, other types of flexibly organized programs are required in order to help busy physicians meet their individual requirements for learning. There is an obvious need for more studies on the impact of educational programs measured in terms of clearly defined objectives and studies on the overall effect of continuing education on the quality of patient care. Because of the complexity and expense involved, the combined efforts of organized medicine is essential.

Other challenges facing the profession include the continuing experimentation and evaluation of different instructional techniques along with the newer educational media. The many information sources such a journals, consultations, and time on teaching servies, which physicians indicate are widely used as a means of keeping current need to be more carefully studied.

Indeed, it would seem that the term "continuing education" must be expanded to include not only formal courses, but these and the many modalities through which physicians may seek their own continuing learning. As stated by Houle (282) "If the practice of learning in groups can be studied, why cannot individual study?"

The many organizations involved in continuing medical education must share the responsibility for devising a total system, whereby all instruments for learning may be integrated into a comprehensive ongoing program of continuing education for the practising physician.

The need to co-ordinate the pre-professional program with continuing medical education requires serious consideration. There is little evidence that an ongoing curriculum from undergraduate to con-

tinuing education has been established. Even more important is the need to inculcate early in the medical student's career, the concept of lifelong learning as a part of his general professional orientation.

The study and practice of medicine is based on the scientific process and, at least in theory, those engaged in the field are trained to solve problems through use of the scientific method. Therefore, it is curious that so little of the scientific method has been applied to the design, management or evaluation of continuing education in medicine. Certain fields of knowledge in the social sciences have accumulated a vast amount of valid data that is immediately relevant to continuing medical education, yet the reports reviewed here showed little evidence that such knowledge is recognized, accepted, and used by the field of medicine. Many of the problems and issues faced in the studies reviewed have occurred in other fields so that continuing medical education can profit from that experience.

CHAPTER VIII

EPILOGUE

Continuing education in the four major health professions has become a matter of growing concern that somewhat belatedly follows the need to keep abreast of expanding knowledge and the demand for better health care. Among these four professions studied, medicine is far in the lead with respect to the quantity of educational activities available to the members of that profession. It is followed in turn by nursing, dentistry, and pharmacy in that order. Each of these fields has approached continuing education differently with respect to the acceptance of the need for education, the resources committed to it, and the kinds of learning activities provided.

In none of the professions is there evidence of a real commitment to continuous learning by its members nor is there any substantial evidence of a real understanding of the educational process. The activities made available tend to be too few in number to meet the need, too badly distributed to be generally available, and too poorly planned and conducted to insure that learning does in fact occur. Medicine has consistently committed proportionately more resources to continuing education than have the other health professions but nursing appears to be more sensitive to the educational process as it applies to continuing education programs. Furthermore, there has been little research in any health profession to find the extent to which existing programs affect the practice of the members of the profession.

PARTICIPATION

Studies of participation in continuing education activities indicate that the members of the several professions are not deeply committed to learning in order to maintain their professional knowledge and skill. Participation rates vary among the four professions and within each. The variation within a profession appears to be related to the degree of specialization of the members. On the whole, the rate of participation falls short of that considered essential by the leadership of the professions.

Individual participation in continuing education is a matter of the attitude and motivation of the individual as well as the relevancy of the programs available.

Attitudes:

The formal school experience of adults develop attitudes about learning that tended to become a barrier to participation in continuing education. The normal pattern of schooling is designed to terminate at various points commensurate with an individual's life goals and vocational expectations. As a result, individuals do not recognize or accept the idea that education must continue throughout life in order to maintain some reasonable adjustment with a rapidly changing world.

The health professions reinforce and in fact, accentuate this terminal concept of education by the ways in which the professions are structured. Admission to the profession is the terminal point in ed-

ucation for many members although those with higher expectations may set new terminal points in certain specializations or for specific positions in the profession. Thus, the attitude that education is terminal is reinforced to the point where it mitigates against participation in education continuously.

The prevelance of this concept of education has plagued adult education as Kidd notes:

> This terminal concept has long stood in opposition to the more creative idea that education is inherently an 'open-ended' process which can never be definitely complete as long as life lasts; and that wherever on the ladder one's schooling may have 'terminated', there still remains an as yet unused capacity for mental and spiritual growth. The need and the capacity for education not only continues throughout life but actually increases as the individual matures, provided that the capacity to learn is persistently exercised.

Prior school experiences have also tended to develop rigid and restrictive attitudes about the nature and form of education and learning. From elementary school through university, education has been structured in set patterns of courses, classes, and subjects in which the learner has been involved only passively with emphasis on the acquisition of information. Consequently, activities are rejected if they fall outside the range of traditional school experiences, because individuals have not learned how to learn. Both those who plan programs for continuing education as well as potential participants are inhibited by these restrictive concepts about education.

Motivation:

The motivation to participate is frequently governed by the achievement goals of an individual. The structure of the professions

tends to restrict or reduce the motivation to participate so that only those motivated by personal satisfaction are apt to participate in further education after they have reached their terminal educational objective.

The growing interest in limited licensure in the health professions is thought to be an incentive for increased participation in continuing education. This does little more than set recurrent terminal points that will undoubtedly motivate individuals to participate in programs. Thus, while it may increase attendance, limited licensure cannot automatically produce the learning that will lead to improved practice.

An individual may be motivated to attend a continuing education program because of limited licensure, but the motivation to engage in learning will develop only if the individual feels the need to learn and experiences the satisfaction resulting from successful learning. Thus, the participation in education essential to improved practice will occur only through good learning experiences.

Relevancy:

Participation is influenced by an individual's perception of his need for learning so that he will be more apt to attend those activities that appear to be related to his needs and interests. The achievement of relevancy is, therefore, crucial but it is inhibited by the fact that few individuals are capable of identifying their need for learning accurately in functional terms.

In order to insure relevancy it is necessary to develop procedures for assessing the need for learning. The health professions have not yet discovered satisfactory ways of determining needs. Attempts to do so through self-assessment inventories succeed in helping to identify information deficiencies but these are not necessarily the real learning needs. Such inventories operate on the assumption that knowing leads automatically to doing but this is the most persistent fallacy in education. Thus, the identification of information deficiencies does not necessarily apply to the real learning needs related to practice.

The several health professions have achieved little with respect to understanding and solving the problem of participation. Since the problem of participation in continuing education is so strongly influenced by attitudes toward education, the basic solution to the problem will require a major change in pre-professional education programs and in the structure of the professions to establish the concept of continuity in learning as a substitute for the present notion that education is terminal.

PROGRAMS

The principal objective of continuing education in the health professions is the achievement of the learning needed to improve patient care. The literature reviewed here presents scant evidence that this objective is actually reached. It also suggests that certain misconceptions about education may be at the root of the trouble.

Planning:

The four major health professions discussed here have shown some creativity in developing educational activities suited to their particular populations but these have been more the exception than the norm. Most of the programs reported in the literature have adhered to the traditional patterns characteristic of schooling and the specific objectives are rarely identified. Whether stated specifically or not, the objectives have been almost exclusively related to the acquisition of information. It is apparent that there is little awareness of the importance of identifying objectives as the first step in program planning. Consequently, most of the programs reported attempted to cover too much material in the time available, were not directed toward a clearly identified end, and could not be evaluated meaningfully. Only by establishing precise and uncomplicated objectives is it possible to plan useful programs, select content, choose appropriate instructional techniques, and measure the achievement of learning.

Instruction:

Nearly all of the programs discussed in the literature used instructional processes that are effective primarily for the diffusion of information with the lecture being the most frequently used technique. None of the reports indicated any awareness of the desirability of selecting instructional techniques to fit the program objectives and the material to be learned. Furthermore, there was little indication that program instructors did more than act as instruments for the diffusion of information.

To accomplish learning effectively and efficiently it is necessary to manage learning. This involves the selection and arrangement of a sequence of events which the learner must be guided through and provided knowledge of the results of his efforts. This guidance of learning is the responsibility of the instructor who must have knowledge about the conditions affecting learning and the ability to plan the sequence of events through which learning occurs. This management function appears to be one of the weakest aspects of continuing education in the health professions.

RESEARCH

Most of the published material about continuing education in the health professions is exhortative. None of the professions have produced any substantial body of research useful in developing this aspect of the profession. Medicine has produced the largest volume of literature and pharmacy the least.

Although each profession has certain unique characteristics that make it necessary to conduct specific research, there is much that is common to all of the health professions and to all adult education. Because of this, interprofessional research into continuing education would be more economical as well as beneficial to all of the professions. There is little evidence in the literature to indicate that the professions know or have used relevant research about adult learning and instruction that has been produced outside the profession. Greater use of such existing research would enable each profession to

concentrate on its own unique questions.

Most of the research literature is descriptive in that it reports programs and procedures used in providing opportunities for continuing education for a particular population. This is most useful for the general spread of innovative program ideas but it contributes little to the advancement of knowledge. Such reports can be enhanced by more complete information about objectives, instruction, the characteristics of the population, and similar data to permit an analysis of the program and the results achieved.

The survey method has been predominant in the studies reviewed. In most cases, this has suffered from inadequate sampling procedures and controls along with incomplete data processing. As a result, the findings are not necessarily valid or reliable, consequently the basic data needed to plan and conduct continuing education activities for the several professions is not yet available.

Very little analytical research that tests relevant hypotheses or seeks to answer crucial questions has been done. As this kind of research increases it will accelerate the accumulation of substantive knowledge about continuing education in the several health professions.

CODA

Although this review of the literature indicates that there is little room for complacency about continuing education in the several health professions, it does show clearly a rapidly growing interest in and concern for the quality and extent of educational opportunities.

The design and conduct of educational activities for adults is itself a specialized body of knowledge and skill comparable to that required to practice in any of the health professions discussed here. It is unusual indeed to find individuals equally equipped for a health profession and for adult education. That this must eventually come to pass is inevitable. Thus, the initiation of improvements in continuing education for the health professions must begin with the development of personnel within each profession for whom adult education is an area of specialization equal to those now generally recognized and accepted by the professions.

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